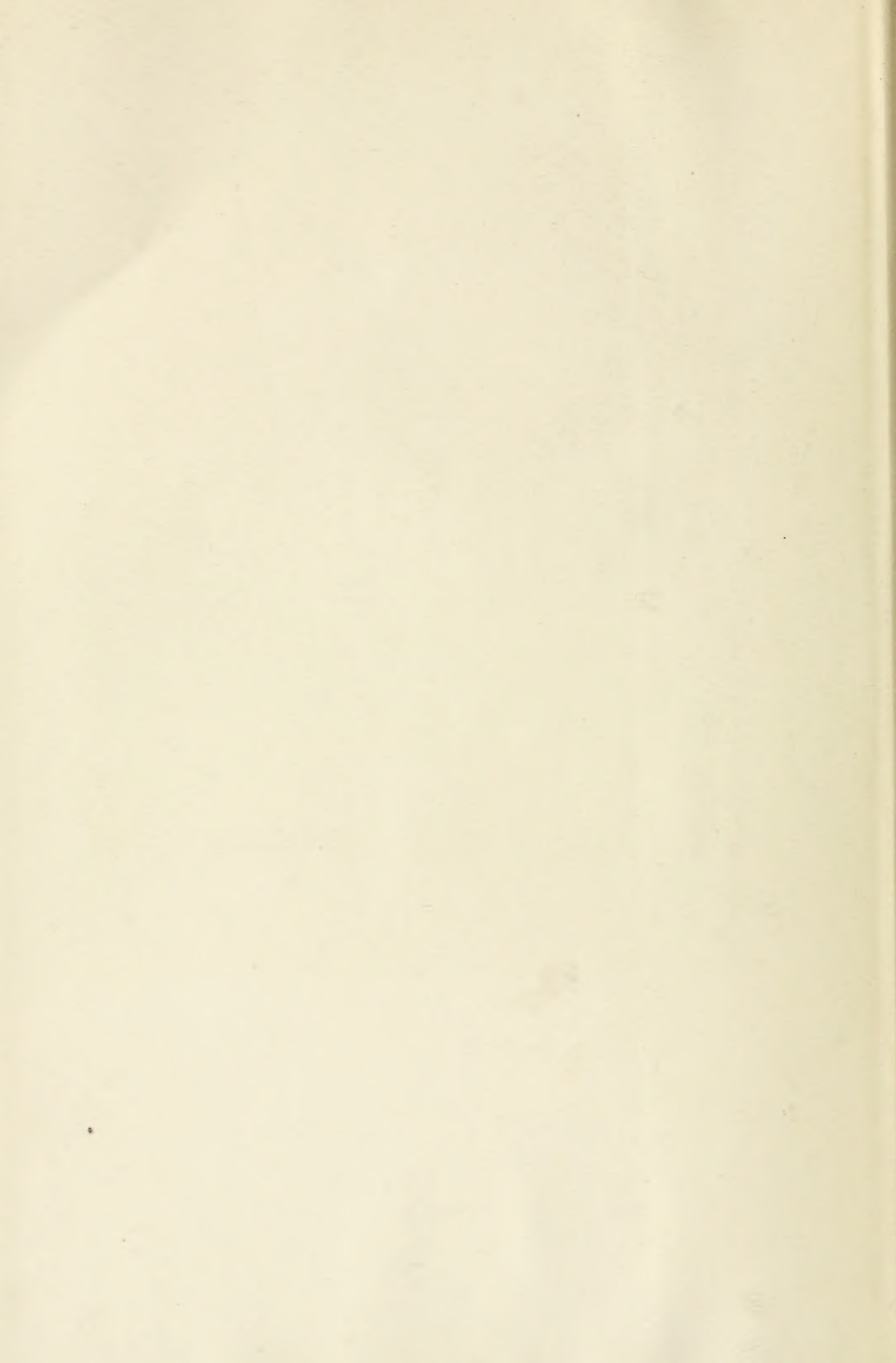
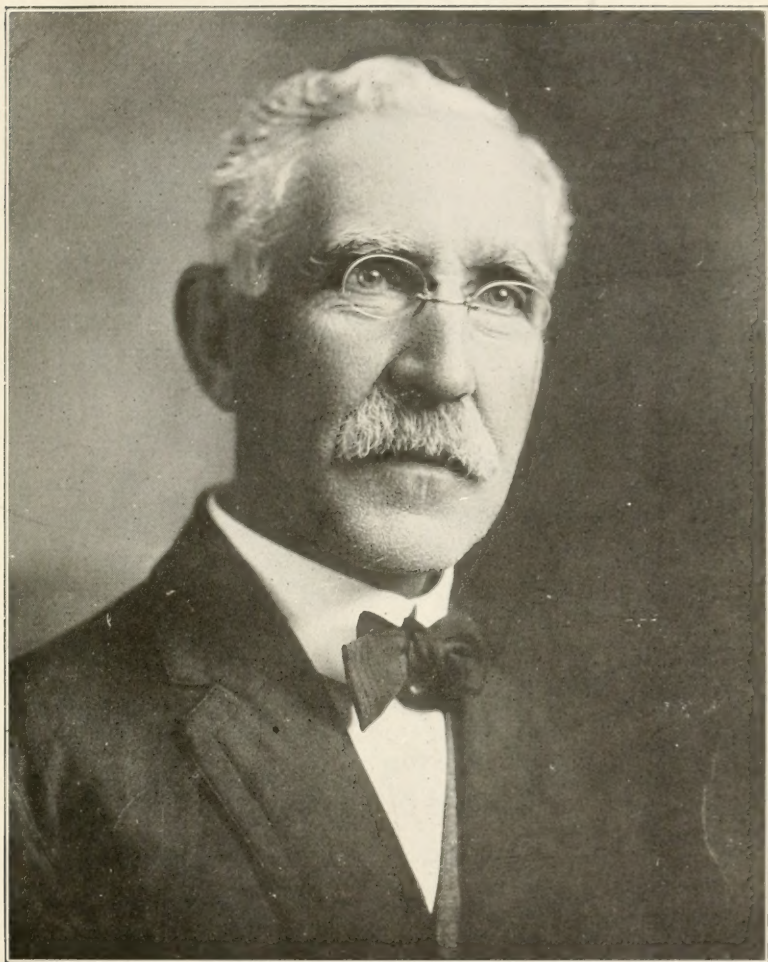


ONTARIO
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January 1922.





LUCIUS E. SAYRE.

PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION 1919-1920.

Lucius Elmer Sayre was born in Brighton, N. J., in 1847. A sketch will be found on p. 3 in the January 1919 number of the *Journal of the American Pharmaceutical Association*; his presidential address is printed in the May issue *Journal A. Ph. A.* for 1920, pp. 469-482. President Sayre joined the American Pharmaceutical Association in 1883, has held important offices therein, and contributed many papers to its Sections. He has been dean of the Pharmacy Department of the University of Kansas since its organization. Since the enactment of the Food and Drugs law in 1906 he has also held, by legislative appointment, the position of directorship of the Drug Laboratory of the State of Kansas.

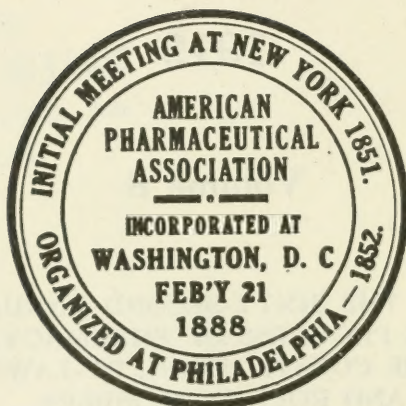
YEAR BOOK
OF THE
AMERICAN PHARMACEUTICAL
ASSOCIATION

1919 **VOLUME 8**
ONTARIO
COLLEGE OF PHARMACY
44 GERRARD ST. E.
TORONTO,

**CONTAINING THE SIXTY-SECOND ANNUAL REPORT
ON THE PROGRESS OF PHARMACY, AND
THE CONSTITUTION, BY-LAWS
AND ROLL OF MEMBERS**

**CORRESPONDING TO VOLUME SIXTY-SEVEN OF THE
FORMER PROCEEDINGS OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION**

CHICAGO, ILL.
Published by the
AMERICAN PHARMACEUTICAL ASSOCIATION
1921



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L. A. BROWN.....Lexington, Ky.	CHARLES E. CASPARI.....St. Louis, Mo.
THEO. WETTERSTROEM.....	Cincinnati, Ohio.

WHOLESALE DRUGGISTS AND MANUFACTURERS.

A. R. L. DOHME, <i>Chairman</i>.....Baltimore, Md.	W. T. HOVER.....Denver, Colo.
CHAS. J. LYNN.....Indianapolis, Ind.	H. K. MUEFORD.....Wayne, Pa.
F. G. RYAN.....	Detroit, Mich.

FACULTIES IN PHARMACY SCHOOLS.

A. H. CLARK, <i>Chairman</i>.....Chicago, Ill.	HUGO H. SCHAEFER.....New York, N. Y.
IVOR GRIFFITH.....Philadelphia, Pa.	E. SPEASE.....Cleveland, Ohio.
C. W. JOHNSON.....	Seattle, Wash.

GENERAL MEMBERSHIP COMMITTEES.

Chairman—WILLIAM B. DAY.....701 So. Wood St., Chicago, Ill.

District No. 1.—*Chairman*, JOHN G. GODDING, 278 Dartmouth Street, Boston, Mass. *Including*, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island.

Connecticut—CURTIS P. GLADDING, *Chairman*, Hartford.

THEODORE WEICKER, Stamford.

LEVI WILCOX, Waterbury.

Maine—M. L. PORTER, *Chairman*, Danforth.

ALFRED P. COOK, Portland.

JOHN COUGHLIN, Augusta.

ALBERT W. MESERVE, Kennebunk.

New Hampshire—WILLIAM D. GRACE, *Chairman*, Portsmouth.

GEORGE H. KNOWLTON, Manchester.

Vermont—WILFRED F. ROOT, *Chairman*, Brattleboro.

W. E. TERRELL, Burlington.

E. G. MCCLELLAN, Rutland.

Massachusetts—THEODORE J. BRADLEY, *Chairman*, Boston.

IRVING P. GAMMON, Brookline.

FLORIN AMRHEIN, Boston.

CARLTON B. WHEELER, Hudson.

C. F. NIXON, Leominster.

Rhode Island—HERBERT HAYNES, *Chairman*, Providence.

J. E. BRENNAN*, Pawtucket.

E. P. ANTHONY, Providence.

M. H. CORRIGAN, Providence.

BENJAMIN F. DOWNING, Newport.

District No. 2.—*Chairman*, JEANNOT HOSTMANN, 115 W. 68th St., New York, N. Y. *Including* New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, District of Columbia.

New Jersey—EDWARD L. WICKHAM, *Chairman*, East Orange.

GEORGE S. CAMPBELL,* Milburn.

HENRY A. JORDEN, Bridgeton.

EDGAR R. SPARKS, Burlington.

HARRY W. CROOKS, Newark.

MISS MARGARET RITCHIE, Newark.

Virginia—C. F. WALKER, *Chairman*, Richmond.

W. F. RUDD, Richmond.

MAUDE LAMBERT, Roanoke.

W. W. ROLSTON, Harrisonburg.

I. F. KNOCK, Petersburg.

J. A. LYLE, Richmond.

R. S. HOPKINS, East Radford.

SAMUEL WEINSTEIN, Richmond.

New York—J. LEON LASCOFF, *Chairman*, New York.

L. BERGER, New York.

* Deceased.

EDWARD S. DAWSON, JR., Syracuse.

GEORGE C. DIEKMANN, New York.

JACOB DIXER, New York.

OTTO RACHENHEIMER, Brooklyn.

GEORGE REIMANN, Buffalo.

FREDERICK P. TUTTILL, Brooklyn.

Maryland—C. I. MEYER, *Chairman*, Baltimore.

JAMES A. BLACK, Baltimore.

ALBERT I. PEAREE, Frederick.

GEORGE E. PEAREE, Frostburg.

District of Columbia—LOUIS FLEMER, *Chairman*, Washington.

S. L. HILTON, Washington.

H. E. KALUSOWSKI, Washington.

West Virginia—B. E. DOWNS, *Chairman*, Welch.

ALFRED WALKER, Sutton.
G. O. YOUNG, Buckhannon.
JOHN RUSSELL GRAHAM, Wheeling.

Delaware—JOHN O. BOSLEY, *Chairman*, Wilmington.

REUBEN M. KAUFMAN, Seaford.
HERBERT K. WATSON, Wilmington.

Pennsylvania—P. H. UTECH, *Chairman*, Meadville.

JOSEPH W. ENGLAND, Philadelphia.
CHARLES F. KRAMER, Harrisburg.
AMBROSE HUNSBERGER, Philadelphia.
LOUIS SAALBACH, Pittsburgh.
L. L. WALTON, Williamsport.

District No. 3—Chairman, LEONARD A. SELTZER, 32 Adams St., West, Detroit, Mich. Including Ohio, Indiana, Illinois, Kentucky, Michigan and Wisconsin.

Illinois—WM. GRAY, *Chairman*, Chicago.

PAUL G. SCHUH,* Cairo.
THOS. D. GREGG, Harrisburg.
JOHN C. WHEATCROFT, Grayville.
S. F. SCHICK, Joliet.

Ohio—EDWARD SPEASE, *Chairman*, Cleveland.

WALDO M. BOWMAN, Toledo.
LEWIS C. HOPP, Cleveland.
THEO. D. WETTERSTROM, Cincinnati.
A. L. FLANDERMAYER, Cleveland.
F. H. FREERICKS, Cincinnati.
M. N. FORD, Columbus.
E. C. DAVIS, Akron.
C. W. ANTONY, Canton.
O. N. CASSIDY, Canton.
ELIZABETH JENKINS, Dayton.

Indiana—F. W. MEISSNER, JR., *Chairman*, La Porte.

C. B. JORDAN, Lafayette.

EMIL REYER, South Bend.

W. H. RUDDER, Salem.

R. L. GREEN, Notre Dame.

Kentucky—OSCAR DILLY, *Chairman*, Louisville.

ADDISON DIMMITT, Louisville.

J. W. GAYLE, Frankfort.

EDWARD L. PIECK, Covington.

Michigan—L. A. SELTZER, *Chairman*, Detroit.

A. A. WHEELER, Detroit.

WILLIAM C. KIRCHGESSNER, Grand Rapids.

HARRY B. MASON, Detroit.

Wisconsin—SOLOMON A. ECKSTEIN, *Chairman*, Milwaukee.

E. S. THATCHER, Milwaukee.

EDWARD WILLIAMS, Madison.

District No. 4—Chairman, E. A. RUDDIMAN, 1916 Adelicia St., Nashville, Tenn. Including North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, Florida, Arkansas, Louisiana, Oklahoma, Texas, Panama, Cuba.

Alabama—CARL WHORTON, *Chairman*, Gadsden.

W. E. BINGHAM, Tuscaloosa.
BERNHARD H. EICHHOLD, Mobile.
LAWRENCE C. LEWIS, Tuskegee.
W. P. THOMASON, Guntersville.

Arkansas—FRANK SCHACHLEITER, *Chairman*, Little Rock.

M. A. EISELE, Hot Springs.
MAYNARD H. POTTER, Piggott.

Georgia—ROBERT H. LAND, JR., *Chairman*, Augusta.

SINCLAIR S. JACOBS, Atlanta.
R. A. ROWLINSKI, Savannah.
ROBERT THOMAS, JR., Thomasville.

Louisiana—R. F. GRACE, *Chairman*, New Orleans.

PHILLIP ASHER, New Orleans.
FABIUS C. GODBOLD, New Orleans.
ADAM WIRTH, New Orleans.

Mississippi—HENRY M. FASER, *Chairman*, University.

GEO. C. KENDALL, Meridan.

Texas—ROBERT H. WALKER, *Chairman*, Gonzales.

J. M. DUGGAN, Cuero.
L. J. BUTTERTY, San Angelo.

Panama—BOLIVAR JURADO, *Chairman*, Panama City.

OSWALD CHAPMAN, Panama City.

Oklahoma—H. S. CALDWELL, *Chairman*, Oklahoma City.

WALTER R. JARRETT, Oklahoma City.

J. C. BURTON, Stroud.

EDWIN DEBARR, Norman.

FRANK A. DINKLER, Hennessey.

THOS. HADLEY, Muskogee.

C. C. BLACKBURN, Okmulgee.

WM. C. ANDERSON, Hugo.

Cuba—JOSE GUILLERMO DIAZ, *Chairman*, Havana.

JOSÉ P. ALACAN, Havana.

ALIRIO DIAZ GUERRA, Brooklyn, N. Y.

Florida—M. M. TAYLOR, *Chairman*, Tampa.

E. BERGER, Tampa.

H. H. D'ALEMBERT, Pensacola.

D. W. RAMSAUR, Jacksonville.

North Carolina—J. G. BEARD, *Chairman*, Chapel Hill.

K. E. BENNETT, Bryson City.

CHARLES P. GREYER, Morgantown.

W. W. HORN, Fayetteville.

EDWARD V. ZOELLER, Tarboro.

South Carolina—JOSEPH B. HYDE, *Chairman*, Charleston.

HENRY PLENCE, Charleston.

W. H. ZIEGLER, Charleston.

Tennessee—WILLIAM R. WHITE, *Chairman*, Nashville.

IRA B. CLARK, Nashville.

E. V. SHELLEY, Memphis.

H. M. OLIVER, Union City.

District No. 5—Chairman, E. L. NEWCOMB, 719 6th Ave., Minneapolis, Minn. Including Missouri, Iowa, Kansas, Nebraska, Minnesota, North Dakota, and South Dakota.

Iowa—G. SCHERLING, *Chairman*, Sioux City.

EDBERT O. KAY, Des Moines.

JOHN M. LINDLY, Des Moines.

AL FULTON, Tipton.

WILLIAM J. TROTTER, Iowa City.

Missouri—J. MERRILL NOBLE, *Chairman*, St. Louis.

H. M. WHITFIELD, St. Louis.

H. V. TINDALL, Excelsior Springs.

R. A. DOTY, East Prairie.

WM. MITTELBACH, Booneville.

D. V. WHITNEY, Kansas City.

FRANCIS HEMM, St. Louis.

Minnesota—E. L. NEWCOMB, *Chairman*, Minneapolis.

WILLIAM A. ARBETT, Duluth.

WM. A. FROST, St. Paul.

CHAS. H. HUNN, Minneapolis.

ROBERT L. MORLAND, Worthington.

Kansas—MATTHIAS NOLL, *Chairman*, Atchison.
 L. D. HAVENHILL, Lawrence.
 J. S. CHISM, Wichita.
 MAXIMILLIAN W. FRIEDENBURG, Winfield.
 EDWARD DORSEY, Ottawa.
 Nebraska—AUTUMN V. PEASE, *Chairman*,
 Fairbury.
 HENRY R. GERING, Omaha.
 EDMOND O. HASCHENBURGER, Lincoln.
 R. A. LYMAN, Lincoln.

North Dakota—W. P. PORTERFIELD, *Chairman*,
 Fargo.
 BURT FINNEY, Bismarck.
 HENRY L. HAUSSAMEN, Grafton.
 South Dakota—DAVID F. JONES, *Chairman*,
 Watertown.
 GEORGE F. SWARTZ, Moleridge.
 E. C. BENT, DELL RAPIDS.
 JAMES ARTHUR POOL, Redfield.

District No. 6.—Chairman, JOSEPH L. LENGFELD, 216 Stockton St., San Francisco, Cal. Including California, Nevada, Utah, Colorado, New Mexico.

California—JOSEPH L. LENGFELD, *Chairman*,
 San Francisco.
 FRANKLIN T. GREEN, San Francisco.
 FRED I. LACKENBACH, San Francisco.
 GEORGE H. P. LICHTHARDT, Sacramento.
 J. G. MUNSON, San José.
 EDWARD G. BINZ, Los Angeles.
 Colorado—FRANK E. MORTENSON, *Chairman*,
 Pueblo.
 W. T. HOVER, Denver.
 CHARLES J. CLAYTON, Denver.

E. G. FINE, Boulder.
 Nevada—JOSEPH M. TABER, *Chairman*,
 Reno.
 W. R. ENGLERT, Elko.
 JOSEPH C. PIERCY, Tonopah.
 New Mexico—BERNARD C. RUPPE, *Chairman*,
 Albuquerque.
 E. G. MURPHEY,* East Las Vegas.
 Utah—JOHN CULLEY, *Chairman*, Ogden.
 W. H. DAYTON, Salt Lake City.
 W. L. EDDY, Brigham City.

District No. 7.—Chairman, JOHN M. A. LAUE, 175 3rd St., Portland, Oregon. Including Washington, Oregon, Idaho, Montana, Wyoming, Alaska.

Idaho—H. H. WHITTLESEY, *Chairman*, Pocatello.
 CLARENCE O. BALLOU, Boise.
 ROY M. SPARGUR, Twin Falls.
 JOHN J. BUEHLER, Pocatello.
 Oregon—ADOLPH ZIEFLE, *Chairman*, Corvallis.
 GEORGE C. BLAKELEY, The Dalles.
 J. LEE BROWN, Marshfield.
 LOUIS G. CLARKE, Portland.
 Alaska—GUY L. SMITH, *Chairman*, Douglas.
 ZACHARY J. LOUSSAC, Anchorage.

WM. E. BRITT, Juneau.
 Montana—FRED WOEHNER, *Chairman*,
 Great Falls.
 CHARLES E. F. MOLLETT, Missoula.
 CHARLES J. CHAPPLE, Billings.
 Washington—CHARLES W. JOHNSON, *Chairman*,
 Seattle.
 G. C. NORTON, Tacoma.
 MRS. EMILY C. McRAE, Spokane.
 CORNELIUS OSSEWARD, Seattle.
 A. W. LINTON, Seattle.

District No. 8, British America.—Chairman, CHARLES F. HEEBNER, Ontario College of Pharmacy, Toronto, Ontario.

ALEXANDER B. J. MOORE, Montreal, Quebec.
 ALEXANDER STEWART, Guelph, Ontario.

HENRY E. J. BLETCHER, Winnipeg, Manitoba.

ORGANIZATION OF LOCAL BRANCHES.

BALTIMORE BRANCH.

President—C. C. NEAL *Secretary*—
Council Representative—E. F. KELLY

CHICAGO BRANCH.

President—A. H. CLARK *Secretary-Treasurer*—E. N. GATHERCOAL
Council Representative—CLYDE M. SNOW

CINCINNATI BRANCH.

President—D. E. MURPHY *Secretary*—CHAS. A. APMEYER
Council Representative—C. T. P. FENNEL

COLUMBUS BRANCH.

President— *Secretary*—
Council Representative—CLAIR A. DYE

DENVER BRANCH.

President—GEORGE G. GREGORY *Secretary*—R. A. WHITE
Council Representative—SAMUEL T. HENSEL

DETROIT BRANCH.

President—ERNEST R. JONES *Secretary*—FREDERICK F. INGRAM, JR.
Council Representative—LEONARD A. SULTZER

* Deceased.

INDIANAPOLIS BRANCH.

President—A. D. THORBURN Secretary—M. P. SCHWARTZ
Council Representative—F. R. ELDRED

LUZERNE COUNTY (PA.) BRANCH.

President—WALTER BANKER *Secretary*—JOSEPH D. MORGAN
Council Representative—

MONTANA BRANCH.

President—CHARLES E. F. MOLLETT *Secretary*—ALEX F. PETERSON
Council Representative—

NASHVILLE BRANCH.

President—L. S. PULLY *Secretary*—WM. R. WHITE
Council Representative—WM. R. WHITE

NEBRASKA BRANCH.

President—A. V. PEASE Secretary-Treasurer—ALBERT SCHNEIDER
Council Representative—R. A. LYMAN

NEW ENGLAND BRANCH.

President—WILLIAM H. GLOVER *Secretary*—FLORIN J. AMRHEIN
Council Representative—ELIE H. LA PIERRE

NEW YORK BRANCH.

President—FRANK L. MCCARTNEY *Secretary*—HUGO H. SCHAEFER
Council Representative—JEANNOTT HOSTMANN

NORTHERN OHIO BRANCH.

President—W. T. HANKEY *Secretary-Treasurer*—HARRY E. MITCHELL
Council Representative—LEWIS C. HOPP

NORTHWESTERN BRANCH.

President—CHAS. H. HUHN *Secretary-Treasurer*—F. A. UPSHER SMITH
Council Representative—F. J. WULLING

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President—B. C. GOODHART *Secretary*—ELMER H. HESSLER
Council Representative—FRANCIS E. STEWART

PITTSBURGH BRANCH.

President—LEASURE K. DARBAKER *Secretary*—B. H. PRITCHARD
Council Representative—J. A. KOCH

SAN FRANCISCO BRANCH.

President—J. L. LENGFELD Secretary—CLARISSA M. ROEHR
Council Representative—CLARISSA M. ROEHR

ST. LOUIS BRANCH.

President—H. B. ST. JOHN *Secretary*—M. EBBERT WEBBER
Council Representative—MERNER J. NOBLE

VIRGINIA BRANCH.

President—JOHN E. JACKSON *Secretary*—CHARLES F. WALKER
Council Representative—WORTLEY F. RUDD

WASHINGTON (D. C.) BRANCH.

President—A. G. DUMÉZ Secretary-Treasurer—H. C. FULLER
Council Representative—H. C. FULLER

HAVANA (CUBA) BRANCH.

President—JOSÉ G. DIAZ Secretary—JOSÉ P. ALACAN
Council Representative—

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION

(NAMES OF DECEASED OFFICERS IN ITALICS>

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852	Philadelphia, Pa.	<i>Daniel B. Smith,</i> Philadelphia.	<i>George W. Andrews,</i> Baltimore.	<i>Samuel M. Colcord,</i> Boston.	<i>C. Augustus Smith,</i> Cincinnati.
Aug. 24, 1853	Boston, Mass.	<i>William A. Brewer,</i> Boston.	<i>George D. Coggeshall,</i> New York.	<i>Alexander Duval,</i> Richmond, Va.	<i>Charles B. Gulhrig,</i> Memphis, Tenn.
July 25, 1854	Cincinnati, O.	<i>William B. Chapman,</i> Cincinnati.	<i>Henry T. Cummings,</i> Portland, Me.	<i>John Meakin,</i> New York.	<i>Joseph Laidley,</i> Richmond, Va.
Sept. 11, 1855	New York, N. Y.	<i>John Meakin,</i> New York.	<i>Charles B. Gulhrig,</i> Memphis, Tenn.	<i>Charles Ellis,</i> Philadelphia.	<i>Henry F. Fish,</i> Waterbury, Conn.
Sept. 9, 1856	Baltimore, Md.	<i>George W. Andrews,</i> Baltimore.	<i>John I. Kidwell,</i> Washington, D. C.	<i>Frederick Stearns,</i> Detroit, Mich.	<i>Henry T. Kiersted,</i> New York.
Sept. 8, 1857	Philadelphia, Pa.	<i>Charles Ellis,</i> Philadelphia.	<i>James Cooke,</i> Fredericksburgh, Va.	<i>Samuel P. Peck,</i> Bennington, Vt.	<i>A. F. Richards,</i> Plaquemine, La.
Sept. 14, 1858	Washington, D. C.	<i>John I. Kidwell,</i> Georgetown, D. C.	<i>Edward R. Squibb,</i> Brooklyn, N. Y.	<i>James O'Gallagher,</i> St. Louis.	<i>Robert Bailey,</i> Rome, Ga.
Sept. 13, 1859	Boston, Mass.	<i>Samuel M. Colcord,</i> Boston.	<i>William Procter, Jr.,</i> Philadelphia.	<i>Joseph Roberts,</i> Baltimore.	<i>Edwin O. Gale,</i> Chicago.
Sept. 11, 1860	New York, N. Y.	<i>Henry T. Kiersted,</i> New York.	<i>William J. M. Gordon,</i> Cincinnati.	<i>William S. Thompson,</i> Baltimore.	<i>Theodore Metcalf,</i> Boston.
Aug. 27, 1862	Philadelphia, Pa.	<i>Wm. Procter, Jr.,</i> Philadelphia.	<i>John Milhan,</i> New York.	<i>Eugene L. Massol,</i> St. Louis.	<i>J. Farris Moore,</i> Baltimore.
Sept. 8, 1863	Baltimore, Md.	<i>J. Farris Moore,</i> Baltimore.	<i>John M. Matsch,</i> Philadelphia.	<i>Chas. A. Tufts,</i> Dover, N. H.	<i>George W. Weyman,</i> Pittsburgh.
Sept. 21, 1864	Cincinnati, O.	<i>William J. M. Gordon,</i> Cincinnati.	<i>Richard H. Stabler,</i> Alexandria.	<i>Enno Sander,</i> St. Louis.	<i>Thomas Hollis,</i> Boston.
Sept. 5, 1865	Boston, Mass.	<i>Henry W. Lincoln,</i> Boston.	<i>George C. Close,</i> Brooklyn, N. Y.	<i>Elijah W. Suckrider,</i> Cleveland, O.	<i>Charles A. Heinrich,</i> Lancaster, Pa.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Aug. 22, 1866	Detroit, Mich.....	<i>Frederick Stearns</i> , Detroit, Mich.	<i>Edward Parrish</i> , Philadelphia.	<i>Ezekiel H. Sargent</i> , Chicago.	<i>John W. Shedden</i> , New York.
Sept. 10, 1867	New York, N. Y. . .	<i>John Milhau</i> , New York.	<i>Robert J. Brown</i> , Leavenworth, Kans.	<i>N. Dynson Jennings</i> , Baltimore.	<i>Daniel Henchman</i> , Boston.
Sept. 8, 1868	Philadelphia, Pa. .	<i>Edward Parrish</i> , Philadelphia.	<i>Ferris Bringhurst</i> , Wilmington, Del.	<i>Edward S. Wayne</i> , Cincinnati.	<i>Albert E. Ebert</i> , Chicago.
Sept. 7, 1869	Chicago, Ill.	<i>Ezekiel H. Sargent</i> , Chicago.	<i>Ferdinand W. Senne- wald</i> , St. Louis.	<i>John J. Pope</i> , New Orleans.	<i>Joel S. Orne</i> , Cambridgeport, Mass.
Sept. 13, 1870	Baltimore, Md. . . .	<i>Richard H. Stabler</i> , Alexandria, Va.	<i>Fleming G. Grieve</i> , Milledgeville, Ga.	<i>James G. Steele</i> , San Francisco.	<i>Eugene L. Massol</i> , St. Louis.
Sept. 12, 1871	St. Louis, Mo.	<i>Enno Sander</i> , St. Louis.	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>George F. H. Markoe</i> Boston.	<i>Matthew F. Ash</i> , Jackson, Miss.
Sept. 3, 1872	Cleveland, O.	<i>Albert E. Ebert</i> , Chicago.	<i>Samuel S. Garrigues</i> , E. Saginaw, Mich.	<i>Edward P. Nichols</i> , Newark, N. J.	<i>Henry C. Gaylord</i> , Cleveland, O.
Sept. 16, 1873	Richmond, Va. . .	<i>John F. Hancock</i> , Baltimore.	<i>William Saunders</i> , London, Ont.	<i>John T. Buck</i> , Jackson, Miss.	<i>Paul Balluff</i> , New York.
Sept. 8, 1874	Louisville, Ky.	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>Joseph Roberts</i> , Baltimore.	<i>William T. Wenzell</i> , San Francisco.	<i>Augustus R. Bayley</i> , Cambridgeport, Mass.
Sept. 7, 1875	Boston, Mass.	<i>George F. H. Markoe</i> , Boston.	<i>Frederick Hoffman</i> , New York.	<i>T. Roberts Baker</i> , Richmond, Va.	<i>Christian F. G. Meyer</i> , St. Louis.
Sept. 12, 1876	Philadelphia, Pa. . .	<i>Charles Bullock</i> , Philadelphia.	<i>Samuel A. D. Shep- pard</i> , Boston.	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Jacob D. Wells</i> , Cincinnati.
Sept. 4, 1877	Toronto, Can.	<i>William Saunders</i> , London, Ont.	<i>Ewen McIntyre</i> , New York.	<i>John Ingalls</i> , Macon, Ga.	<i>Emlen Painter</i> , San Francisco.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Nov. 26, 1878	Atlanta, Ga.	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Frederick T. Whiting</i> , Great Barrington, Mass.	<i>Henry J. Rose</i> , Toronto, Can.	<i>William H. Crayford</i> , St. Louis.
Sept. 9, 1879	Indianapolis, Ind. . .	<i>George W. Sloan</i> , Indianapolis, Ind.	<i>T. Roberts Baker</i> , Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	<i>Philip C. Candidus</i> , Mobile, Ala.
Sept. 14, 1880	Saratoga, N. Y. . . .	<i>James T. Shinn</i> , Philadelphia.	George H. Schafer, Fort Madison, Ia.	<i>William S. Thompson</i> , Washington, D. C.	<i>William Simpson</i> , Raleigh, N. C.
Aug. 23, 1881	Kansas City, Mo. . .	<i>P. Wendover Bedford</i> , New York.	<i>Emlen Painter</i> , San Francisco.	<i>George Leis</i> , Lawrence, Kans.	<i>John F. Judge</i> , Cincinnati.
Sept. 12, 1882	Niagara Falls, N. Y. .	<i>Charles A. Heinilsh</i> , Lancaster, Pa.	<i>John Ingalls</i> , Macon, Ga.	<i>Louis Dohme</i> , Baltimore.	<i>William B. Blanding</i> , Providence, R. I.
Sept. 11, 1883	Washington, D. C. .	<i>William S. Thompson</i> , Washington, D. C.	<i>Charles Rice</i> , New York.	<i>Frederick H. Masi</i> , Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884	Milwaukee, Wis. . . .	<i>John Ingalls</i> , Macon, Ga.	<i>John A. Dadd</i> , Milwaukee, Wis.	<i>Henry Canning</i> , Boston.	<i>Charles F. Goodman</i> , Omaha, Neb.
Sept. 8, 1885	Pittsburgh, Pa. . . .	<i>Joseph Roberts</i> , Baltimore.	<i>Albert H. Hollister</i> , Madison, Wis.	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	<i>Joseph S. Evans</i> , West Chester, Pa.
Sept. 7, 1886	Providence, R. I. . .	<i>Chas. A. Tufts</i> , Dover, N. H.	<i>Henry J. Menninger</i> , Brooklyn, N. Y.	<i>M. W. Alexander</i> , St. Louis.	<i>Norman A. Kuhn</i> , Omaha, Neb.
Sept. 5, 1887	Cincinnati, O.	John U. Lloyd, Cincinnati.	<i>M. W. Alexander</i> , St. Louis.	<i>A. K. Finlay</i> , New Orleans.	<i>Karl Simmon</i> , St. Paul, Minn.
Sept. 3, 1888	Detroit, Mich.	<i>M. W. Alexander</i> , St. Louis.	Jas. Vernor, Detroit, Mich.	Fred Wilcox, Waterbury, Conn.	<i>Alvin A. Feager</i> , Knoxville, Tenn.
June 24, 1889	San Francisco, Cal. .	<i>Emlen Painter</i> , New York.	<i>Karl Simmons</i> , St. Paul, Minn.	<i>Wm. M. Searby</i> , San Francisco.	<i>Joseph W. Eckford</i> , Aberdeen, Miss.
Sept. 8, 1890	Old Pt. Comfort, Va.	<i>A. B. Taylor</i> , Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	<i>Chas. E. Dohme</i> , Baltimore.	<i>James M. Good</i> , St. Louis.
April 27, 1891	New Orleans, La. . .	<i>A. K. Finlay</i> , New Orleans.	<i>Geo. J. Seabury</i> , New York.	<i>W. H. Torbert</i> , Dubuque, Ia.	<i>L. T. Dunning</i> , Sioux Falls, S. D.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
July 14, 1892	Profile House, N. H.	<i>Jos. P. Remington</i> , Philadelphia.	<i>A. P. Preston</i> , Portsmouth, N. H.	<i>Sidney P. Watson</i> , Atlanta, Ga.	<i>Wm. H. Averill</i> , Frankfort, Ky.
Aug. 14, 1893	Chicago, Ill.	Edgar L. Patch, Boston.	<i>Leo Eliel</i> , South Bend, Ind.	<i>Wiley Rogers</i> , Louisville, Ky.	<i>Chas. Caspary, Jr.</i> , Baltimore.
Sept. 3, 1894	Asheville, N. C.	<i>William Simpson</i> , Raleigh, N. C.	Chas. M. Ford, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	<i>Jas. E. Morrison</i> , Montreal, Can.
Aug. 14, 1895	Denver, Colo.	<i>James M. Good</i> , St. Louis.	<i>Chas. E. Dohme</i> , Baltimore. *	A. Brandeburger, Jefferson City, Mo.	<i>Mrs. M. O. Miner</i> , Hiawatha, Kans.
Aug. 12, 1896	Montreal, Can.	<i>Joseph E. Morrison</i> , Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parison, Perth Amboy, N. J.
Aug. 23, 1897	Lake Minnetonka, Minn.	<i>Henry M. Whitney</i> , Lawrence, Mass.	<i>George C. Bartells</i> , Camp Point, Ill.	<i>Wm. S. Thompson</i> , Washington, D. C.	<i>Jacob A. Miller</i> , Harrisburg, Pa.
Aug. 29, 1898	Baltimore, Md.	<i>Charles E. Dohme</i> , Baltimore.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Josic A. Wanous, Minneapolis, Minn.
Sept. 4, 1899	Put-in-Bay, O.	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	<i>Wm. L. Dewoody</i> , Pine Bluff, Ark.	<i>Henry R. Gray</i> , Montreal, Can.
May 7, 1900	Richmond, Va.	<i>Jno. F. Patton</i> , York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.
Sept. 16, 1901	St. Louis, Mo.	Henry M. Whelpley, St. Louis.	<i>Wm. Searby</i> , San Francisco.	George F. Payne, Atlanta, Ga.	<i>Wm. S. Thompson</i> , Washington, D. C.
Sept. 8, 1902	Philadelphia, Pa.	Geo. F. Payne, Atlanta, Ga.	Wm. L. Cliffe, Philadelphia, Pa.	Eugene G. Eberle, Dallas, Texas.	<i>Henry Willis</i> , Quebec, Can.
Aug. 3, 1903	Mackinac Island, Mich.	Lewis C. Hopp, Cleveland, O.	<i>Wm. C. Alpers</i> , New York.	Albert M. Roehrig, Stapleton, N. Y.	Otto F. Claus, St. Louis, Mo.
Sept. 5, 1904	Kansas City, Mo.	James H. Beal, Scio, O.	<i>Philip C. Candidus</i> , Mobile, Ala.	Wm. Mittelbach, Boonville, Mo.	Julius A. Koch, Pittsburgh, Pa.
Sept. 4, 1905	Atlantic City, N. J.	Jos. L. Lemberger, Lebanon, Pa.	<i>Chas. Holschauer</i> , Newark, N. J.	Chas. A. Rapelye, Hartford, Conn.	Fabius C. Godbold, New Orleans, La.

LIST OF OFFICERS (Concluded).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 3, 1906	Indianapolis, Ind.	<i>Leo Eliel</i> , South Bend, Ind.	Wm. Mittelbach, Boonville, Mo.	<i>C. S. N. Hallberg</i> , Chicago, Ill.	<i>Thomas P. Cook</i> , New York, N. Y.
Sept. 2, 1907	New York, N. Y.	<i>Wm. M. Seabry</i> , San Francisco, Cal.	<i>Oscar Oldberg</i> , Chicago, Ill.	Henry H. Rusby, New York, N. Y.	Oscar W. Bethea, Meridian, Miss.
Sept. 7, 1908	Hot Springs, Ark.	<i>Oscar Oldberg</i> , Chicago, Ill.	Eugene G. Eberle, Dallas, Texas.	Wm. Mittelbach, Boonville, Mo.	James H. Beal, Scio, O.
Aug. 16, 1909	Los Angeles, Cal.	Henry H. Rusby, Newark, N. J.	Clement V. Lowe, Philadelphia, Pa.	Chas. W. Johnson, Seattle, Wash.	Wm. B. Day,
May 2, 1910	Richmond, Va.	Eugene G. Eberle, Dallas, Texas.	Wm. B. Day, Chicago, Ill.	Otto F. Claus, St. Louis, Mo.	Chicago, Ill.
Aug. 14, 1911	Boston, Mass.	John G. Godding, Boston, Mass.	W. Bodemann, Chicago, Ill.	Chas. M. Ford, Denver, Colo.	Leonard A. Seltzer, Detroit, Mich.
Aug. 19, 1912	Denver, Colo.	William B. Day, Chicago, Ill.	Chas. M. Ford, Denver, Colo.	Caswell A. Mayo, New York, N. Y.	Ernest Berger, Tampa, Fla.
Aug. 18, 1913	Nashville, Tenn.	George M. Beringer, Camden, N. J.	Denver, Colo.	New York, N. Y.	C. Herbert Packard, East Boston, Mass.
Aug. 24, 1914	Detroit, Mich.	Caswell A. Mayo, New York, N. Y.	<i>Franklin M. Apple</i> , Philadelphia, Pa.	Wm. S. Richardson, Washington, D. C.	L. D. Havenhill, Lawrence, Kans.
Aug. 9, 1915	San Francisco, Cal.	<i>Wm. C. Alpers</i> , Cleveland, O.	L. D. Havenhill, Lawrence, Kans.	C. Herbert Packard, East Boston, Mass.	Charles Gietner, St. Louis, Mo.
Sept. 5, 1916	Atlantic City, N. J.	Fred. J. Wulling, Minneapolis, Minn.	C. H. LaWall, Philadelphia, Pa.	E. A. Ruddiman, Nashville, Tenn.	Linwood A. Brown, Lexington, Ky.
Aug. 28, 1917	Indianapolis, Ind.	<i>Charles Holzhauser</i> , Newark, N. J.	Leonard A. Seltzer, Detroit, Mich.	Lucius E. Sayre, Lawrence, Kans.	<i>Philip Asher</i> , New Orleans, La.
Aug. 12, 1918	Chicago, Ill.	Charles H. LaWall, Philadelphia, Pa.	Alfred R. L. Dohme, Baltimore, Md.	Leonard A. Seltzer, Detroit, Mich.	Theodore J. Bradley, Boston, Mass.
Aug. 25, 1919	New York, N. Y.	L. E. Sayre, Lawrence, Kans.	F. W. Nitardy, Brooklyn, N. Y.	Theodore J. Bradley, Boston, Mass.	Francis Hemm, St. Louis, Mo.
			Theo. J. Bradley, Boston, Mass.	Harry Whitehouse, Johnson City, Tenn.	E. Fullerton Cook, Philadelphia Pa.

HONORARY PRESIDENTS.

Philip C. Candius, Mobile, Ala., 1907-08.
Samuel A. D. Sheppard, Boston, Mass.,
 1908-09.
Enno Sander, St. Louis, Mo., 1909-10.

Ewen McIntyre, New York, N. Y., 1910-11.
Henry Bivoll, Chicago, Ill., 1911-12.
Thomas F. Main, New York, N. Y., 1912-13.
Albert B. Lyons, Detroit, Mich., 1913-14.

Geo. H. Schafer, Ft. Madison, Ia., 1914-15.
Fabius C. Godbold, New Orleans, La.,
 1915-16.
J. O. Burge, Nashville, Tenn., 1916-17.
W. L. Dewody, Pine Bluff, Ark., 1917-18.
Oliver F. Fuller, Chicago, Ill., 1918-19.
Alviso B. Stevens, Escondido, Cal., 1919-20.

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852-54.
Samuel L. Colcord, Boston, 1854-56 and
 1857-59.
James S. Aspinwall, New York, 1856-57.

Ashel Boyden, Boston, 1859-60.
Henry Haviland, New York, 1860-63.
J. Brown Baxley, Baltimore, Md., 1863-65.
Charles A. Tufts, Dover, N. H., 1865-86.

Samuel A. D. Sheppard, Boston, 1886-1908.
Henry M. Whelpley, St. Louis, 1908-20.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852-53.
Edward Parrish, Philadelphia, 1853-54.
Edward S. Wayne, Cincinnati, 1854-55.

Peter W. Bedford, New York, 1862-63.
William Evans, Jr., Philadelphia, 1863-64.
Henry N. Rittenhouse, Philadelphia, 1864-65.

CORRESPONDING SECRETARIES.

William Procter, Jr., Philadelphia, 1852-53
 and 1854-57.
William B. Chapman, Cincinnati, 1853-54.
Edward Parrish, Philadelphia, 1857-58.

John M. Maisch, Philadelphia, 1862-63.

PERMANENT SECRETARIES.

John M. Maisch, Philadelphia, 1865-Sept., 1893.
Henry M. Whelpley, St. Louis (acting), August, 1893.

Joseph P. Remington, Philadelphia, 1893-94.
Chas. Caspari, Jr., Baltimore, 1894-96.

GENERAL SECRETARIES.

Chas. Caspari, Jr., 1896-1911.

James H. Beal, Scio, Ohio, 1911-14.
Wm. B. Day, Chicago, Ill., 1914-20.

LOCAL SECRETARIES.

For the meeting held in	For the meeting held in
1867. <i>P. Wendover Bedford.</i>	1885. <i>George A. Kelly.</i>
1868. <i>Alfred B. Taylor.</i>	1886. <i>William B. Blanding.</i>
1869. <i>Henry W. Fuller.</i>	1887. <i>George W. Voss.</i>
1870. <i>J. Faris Moore.</i>	1888. <i>James Vernon.</i>
1871. <i>William H. Crawford.</i>	1889. <i>Edward W. Runyon.</i>
1872. <i>Henry C. Gaylord.</i>	1890. <i>Charles E. Dohne.</i>
1873. <i>Thomas H. Hazard.</i>	1891. <i>A. K. Finlay.</i>
1874. <i>Emil Scheffer.</i>	1892. <i>H. M. Whitney.</i>
1875. <i>Samuel A. D. Sheppard.</i>	1893. <i>Henry Biroth.</i>
1876. <i>Adolphus W. Miller.</i>	1894. <i>W. G. Smith.</i>
1877. <i>Henry J. Rose.</i>	1895. <i>Edm. L. Scholtz.</i>
1878. <i>Jesse W. Rankin.</i>	1896. <i>Joseph E. Morrison.</i>
1879. <i>Eli Lilly.</i>	1897. <i>Edw. Shumpik.</i>
1880. <i>Charles F. Fish.</i>	1898. <i>Henry P. Hyntson.</i>
1881. <i>William T. Ford.</i>	1899. <i>Lewis C. Hopp.</i>
1882. <i>Hiram E. Griffith.</i>	1900. <i>T. Ashby Miller.</i>
1883. <i>Charles Becker.</i>	1901. <i>H. M. Whelpley.</i>
1884. <i>Henry C. Schranck.</i>	1902. <i>William L. Cliffe.</i>

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873-91 and 1895-1915; *Chas. Rice*, New York, N. Y., 1891-92; *Henry Kraemer*, Philadelphia, Pa., 1892-95;
J. A. Koch, Pittsburgh, Pa., 1915-16; *H. V. Army*, New York, N. Y., 1916-20.

PAST AND PRESENT OFFICERS OF THE SECTIONS.

SECTION ON COMMERCIAL INTERESTS.		SECTION ON PHARMACY.	
Chairman.		Chairman.	
1887-88. <i>A. H. Hollister.</i>	<i>Secretary.</i>	1889-90. <i>Leo Eliel.</i>	<i>Secretary.</i>
1888-89. <i>A. H. Hollister.</i>	<i>J. W. Colcord.</i>	1890-91. <i>Henry Canning.</i>	<i>F. B. Kilmer.</i>
	<i>J. W. Colcord.</i>	1891-92. <i>W. H. Tolbert.</i>	<i>W. L. Deceody.</i>
			<i>Arthur Bassett.</i>

PAST AND PRESENT OFFICERS OF THE SECTIONS (Continued).	
Secretary.	Chairman.
Arthur Bassett.	1887-88 <i>T. Roberts Baker.</i>
<i>Jas. O. Burge.</i>	1888-89 <i>Emlen Painter.</i>
<i>Jas. O. Burge.</i>	1889-90 Henry Whelpley.
Clay W. Holmes.	1890-91 E. L. Patch.
E. D'Avignon.	1891-92 <i>C. S. N. Hallberg.</i>
Jas. H. Bobbitt.	1892-93 C. T. P. Fennel.
Jas. H. Bobbitt.	1893-94 L. E. Sayre.
Charles A. Rapelye.	1894-95 A. R. L. Dohme.
F. W. Messiner.	1895-96 S. P. Sadtler.
E. G. Eberle.	1896-97 <i>W. C. Alpers.</i>
Wm. C. Anderson.	1897-98 Edward Kremers.
Robert C. Reilly.	1898-99 Henry H. Rusby.
Robert C. Reilly.	1899-00 <i>Frank G. Ryan.</i>
Herman D. Kniseley.	1900-01 <i>Oscar Oldberg.</i>
Charles H. Avery.	1901-02 Lyman F. Kebler.
George O. Young.	1902-03 <i>J. O. Schlatterbeck.</i>
Erich H. Ladish.	1903-04 William A. Puckner.
G. H. P. Lichthardt.	1904-05 Eustace H. Gane.
Benj. E. Pritchard.	1905-06 Charles E. Caspari.
D. W. Ramsaur.	1906-07 Reid Hunt.
William R. White.	1907-08 Virgil Coblentz.
Grant W. Stevens.	1908-09 Charles E. Vanderkleed.
David Stolz.	1909-10 <i>Martin I. Wilbert.</i>
J. C. McGee.	1910-11 Albert H. Clark.
Robt. P. Fischelis.	1911-12 W. O. Richtmann.
F. W. Nitardy.	1912-13 Frank R. Eldred.
H. S. Noel.	1913-14 Edsel A. Ruddiman.
C. O. Lee.	1914-15 H. Engelhardt.
Chairman.	Secretary.
1892-93 W. H. Torbert.	A. B. Lyons.
1893-94 <i>Wiley Rogers.</i>	H. M. Whelpley.
1894-95 <i>Geo. J. Seabury.</i>	C. F. Dare.
1895-96 <i>Geo. J. Seabury.</i>	<i>C. S. N. Hallberg.</i>
1896-97 Lewis C. Hopp.	H. W. Snow.
1897-98 Joseph Jacobs.	F. G. Ryan.
1898-99 Joseph Jacobs.	C. M. Ford.
1899-00 <i>James M. Good.</i>	<i>George B. Kauffman.</i>
1900-01 Charles A. Rapelye.	<i>W. C. Alpers.</i>
1901-02 F. W. Messiner.	V. Coblentz.
1902-03 Thomas V. Wooten.	A. B. Lyons.
1903-04 <i>Wm. L. Devoody.</i>	H. V. Army.
1904-05 Charles R. Sherman.	Caswell A. Mayo.
1905-06 <i>Henry P. Hyinson.</i>	Lyman F. Kebler.
1906-07 Herman D. Kniseley.	Jos. W. England.
1907-08 Jacob Diner.	Jos. W. England.
1908-09 Harry B. Mason.	Eustace H. Gane.
1909-10 Waldo M. Bowman.	Charles E. Caspari.
1910-11 <i>Franklin M. Apple.</i>	Daniel Base.
1911-12 Ernest Berger.	Virgil Coblentz.
1912-13 Autumn V. Pease.	Chas. E. Vanderkleed.
1913-14 C. G. Lindvall and H. B. Mason.	<i>Martin I. Wilbert.</i>
1914-15 E. H. Thiesing.	Albert H. Clark.
1915-16 R. S. Lehmann.	Wm. O. Richtmann.
1916-17 P. Henry Utech.	Charles H. LaWall.
1917-18 Robt. P. Fischelis.	Freeman P. Stroup.
1918-19 E. Fullerton Cook.	Wilbur L. Scoville.
1919-20 H. S. Noel.	William Mansfield.

PAST AND PRESENT OFFICERS OF THE SECTIONS (Continued).

<i>Chairman.</i>		<i>Secretary.</i>	
1915-16	W. L. Scoville.	1900-01	C. B. Lowe.
1916-17	J. L. Turner.	1901-02	E. G. Eberle.
1917-18	W. W. Stockberger.	1902-03	J. W. T. Knox.
1918-19	E. N. Gathercoal.	1903-04	Harry B. Mason.
1919-20	Jacob Diner.	1904-05	Wm. L. Cliffe.
SECTION ON PHARMACEUTICAL EDUCATION.		1905-06	Wm. L. Cliffe.
<i>Chairman.</i>		1906-07	Jos W. England.
1887-88	R. F. Bryant.	1907-08	Jos. W. England.
1888-89	C. W. Day.	1908-09	Chas. H. LaWall.
SECTION ON PHARMACEUTICAL LEGISLATION.		1909-10	Chas. W. Johnson.
<i>Chairman.</i>		1910-11	W. J. Teeters.
1887-88	John F. Judge.	1911-12	W. J. Teeters.
1888-89	P. W. Bedford.	1912-13	Frank H. Freericks.
SECTION ON EDUCATION AND LEGISLATION.		1913-14	Frank H. Freericks.
<i>Chairman.</i>		1914-15	R. A. Kuever.
1889-90	P. W. Bedford.	1915-16	R. A. Kuever.
1890-91	William Simon.	1916-17	C. B. Jordan.
1891-92	A. B. Stevens.	1917-18	W. F. Rudd.
1892-93	R. G. Eccles.	1918-19	C. A. Dye.
1893-94	R. G. Eccles.	1919-20	Edward Spease.
1894-95	James M. Good.	SECTION ON PRACTICAL PHARMACY AND DISPENSING.	
1895-96	C. S. N. Hallberg.	<i>Chairman.</i>	
1896-97	C. S. N. Hallberg.	1900-01	H. P. Hynson.
1897-98	James H. Beal.	1901-02	F. W. E. Stedem.
1898-99	A. B. Lyons.	1902-03	Geo. M. Beringer.
1899-00	C. B. Lowe.	1903-04	William H. Burke.
		1904-05	Charles A. Rapelye.
		<i>Secretary.</i>	
		1900-01	F. W. E. Stedem.
		1901-02	William Kaemmerer.
		1902-03	William H. Burke.
		1903-04	E. A. Ruddiman.
		1904-05	Wm. C. Kirchgessner.

<i>Chairman.</i>	<i>Vice-Chairman.</i>	<i>Secretary.</i>
1883-84. Joseph P. Remington.	<i>C. Lewis Diehl.</i>	George W. Kennedy.
1884-85. " "	<i>John A. Dadd.</i>	" "
1885-86. " "	<i>C. Lewis Diehl.</i>	" "
1886-87. Wm. S. Thompson.	<i>H. J. Menninger.</i>	" "
1887-88. Wm. H. Rogers.	<i>Karl Simmon.</i>	" "
1888-89. Jas. M. Good.	<i>Emlen Painter.</i>	" "
1889-90. " "	<i>Wm. S. Thompson.</i>	" "
1890-92. " "	<i>Wm. S. Thompson.</i>	" "
1892-94. " "	<i>H. M. Whitney.</i>	" "
1894-95. Wm. S. Thompson.	" "	" "
1895-96. " "	<i>Wm. C. Alpers.</i>	" "
1896-1901. " "	<i>Jas. M. Good.</i>	" "
1901-02. A. B. Prescott.	<i>Chas. E. Dolme.</i>	" "
1902-03. James H. Beal.	<i>Lewis C. Hopp.</i>	Henry M. Whelpley.
1903-04. " "	<i>Leo Eliel.</i>	" "
1904-05. " "	<i>Jos. L. Lemberger.</i>	" "
1905-06. " "	<i>Wm. C. Alpers.</i>	" "
1906-08. " "	<i>Albert M. Roehrig.</i>	" "
1908-09. Jos. P. Remington.	<i>Wm. S. Searby,</i>	Joseph W. England.
1909-10. Fabius C. Godbold.	<i>Julius A. Koch.</i>	" "
1910-11. James H. Beal.	<i>Henry H. Rusby.</i>	" "
1911-12. Eugene G. Eberle.	<i>James M. Good.</i>	" "
1912-13. " "	<i>Fabius C. Godbold.</i>	" "
1913-16. " "	<i>J. C. Godding.</i>	" "
1916-19. Lewis C. Hopp.	<i>S. L. Hilton.</i>	" "
1919-20. " "	<i>Charles H. LaWall.</i>	" "

OFFICERS OF THE HOUSE OF DELEGATES SINCE ITS FIRST ORGANIZATION.

<i>Chairman.</i>	<i>First Vice-Chairman.</i>	<i>Second Vice-Chairman.</i>	<i>Secretary.</i>
1912-13 W. C. Anderson.	C. M. Snow.	W. S. Richardson.	Clarissa M. Rochr.
1913-14 C. M. Snow.	W. S. Richardson.	O. F. Claus.	R. A. Kuever.
1914-15 W. S. Richardson.	C. B. Jordan.	H. M. Faser.	<i>Joseph Weinstein.</i>
1915-16 <i>H. P. Hynson.</i>	F. W. Nitardy.	O. F. Claus.	Jeannot Hostmann.
1916-17 J. H. Beal.	S. C. Henry.	" "	"
1917-18 S. C. Henry.	O. F. Claus.	S. L. Hilton.	"
1918-19 O. F. Claus.	S. L. Hilton.	E. F. Kelly.	"
1919-20 S. L. Hilton.	E. F. Kelly.	E. L. Newcomb.	"

CONSTITUTION AND BY-LAWS

OF THE

American Pharmaceutical Association

(Revised to September 1, 1920, inclusive.)

CONSTITUTION

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated, to the Association, may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be printed in the JOURNAL at least thirty days prior to the annual meeting, shall be read at the first general session of the annual meeting, and shall be balloted upon at a subsequent general session, when, upon receiving the affirmative votes of two-thirds of the members present, it shall become a part of the Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS

(Revised to September 1, 1920, inclusive.)

CHAPTER I.

Of the Election of Officers.

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the Offices of President, First Vice-President, Second Vice-President, Third Vice-President and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association within three months after he receives them, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after its receipt.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who shall count as votes in the annual election only the votes of those members whose dues have been paid for the current year, and who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the JOURNAL of the Association.

ARTICLE IV. The officers thus elected by a plurality of the votes cast shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Honorary President, Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

CHAPTER II.

Of the President and Vice-Presidents.

ARTICLE I. The president shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all, a President *pro tempore*, shall perform the duties of the President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees not provided for in the By-Laws or otherwise directed by the Association. He shall announce the names of the appointees on such committees, as far as possible, at the time of his installation or within thirty days thereafter.

ARTICLE VIII. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific or other questions as may to him seem suitable to the occasion.

CHAPTER III.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed \$1200, and the amount of his expenses incident to the meeting, in addition to his salary. He shall give bond for the proper disposition of the funds of the Association which may come into his hands, in such amount as may be prescribed by the Council.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general session, and carefully preserve, on file, all reports, essays and papers of every description presented to the association, and shall be charged with the necessary foreign and scientific correspondence, and with the distribution of the Report on the Progress of Pharmacy under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called, shall notify all officers of the association and the chairmen of all standing and special committees of their election or appointment, giving each a statement of his duties and such other information as may be of service and shall perform such other duties as are prescribed in the Constitution and By-Laws or which may be assigned to him by the Council or the Association.

CHAPTER IV.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairman of the several committees, and with other members in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers and apparatus destined for use or exhibition at the meetings.

ARTICLE II. An exhibition of objects interesting to pharmacists may be held each year, should the Council so determine, under the direction of the Local Secretary and the Section on Commercial Interests.

CHAPTER V.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for six months.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed \$1000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds for the amount of \$15,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by a Trust Company acceptable to the Council.

CHAPTER VI.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed \$1,200.

ARTICLE II. All journals and volumes received in exchange for the Report on the Progress of Pharmacy by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such data as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad. He shall also prepare an index or brief extract of current pharmaceutical and chemical literature for publication in the Journal of the Association.

ARTICLE IV. The Report on the Progress of Pharmacy shall be edited, published and distributed under rules and regulations approved by the Council. It shall be issued as a yearly volume, covering each fiscal year of the Association.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VII.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association.

Any member of the Association may attend the meetings of the Council, and may, by permission of the presiding officer, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of *ex-officio* members; one member, from each local branch of this Association and nine other members, selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the place of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Honorary President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor-in-chief of the JOURNAL, the Chairmen of the Sections of the Association, the Secretary of the Council, and the Historian of the Association shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, two standing committees of the Council—a Committee on Publication and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually, or as often as required, to the Council, and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

ARTICLE VIII. The Council shall have charge of the revision of the roll of members, and the editing, publication and distribution of all the publications of the Association.

The Secretary of the Council shall submit to the Council the names of the candidates who have been proposed for membership, when a majority vote shall be sufficient to elect them.

ARTICLE IX. The Council shall furnish to each member of the Association, not in arrears, one copy of the Report on the Progress of Pharmacy, which publication shall contain, in addition to the report, a list of the officers and committees, prefatory matter, constitution and by-laws, general rules, roll of members, list of members, and such other matter as may be deemed desirable by the Council. It shall fix, also, the price for which copies of the Report may be sold.

ARTICLE X. The Council shall issue a monthly journal, beginning in January, 1912, and thereafter, under rules and regulations to be adopted by the Council, and shall furnish copies of such publication to each member of the Association not in arrears for subscription. The publication shall contain editorials, original articles, the proceedings of the annual meetings, of the Council, and of the branches, and such other matter as may be deemed desirable by the Council.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing whether in business on his own account, retired from business, or employed by another, teachers of Pharmacy, Chemistry and Botany who may be especially interested in Pharmacy and Materia Medica, editors and publishers of pharmaceutical journals and other persons interested in the progress of the science and art of pharmacy, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of members for non-payment of dues may be re-admitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be re-admitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of a majority of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any newly elected member, upon the payment of annual dues for the year in which he is elected, shall be entitled to the annual volume of the Report on the Progress of Pharmacy and such other publications of the Association as are distributed to its members free of charge during the year. Any application for membership made during the fiscal year (the calendar year shall be the fiscal year of the Association) shall apply to the current fiscal year; except between June and January, when, if desired, it can be made to apply to the next fiscal year, if so stated on the application. The publications will be sent for the fiscal year in which the dues and subscription are credited except to those who have resigned or have been dropped from the rolls for the non-payment of dues prior to the issuance of any such publication.

The price for the Report on the Progress of Pharmacy to non-members shall be fixed by the Council. The subscription price for the JOURNAL of the Association shall be four dollars per annum to members and non-members alike. The subscription of the JOURNAL must be separate and distinct from the annual dues, although both may be paid at one and the same time.

ARTICLE III. Every member shall pay *in advance* to the Treasurer the sum of four dollars as annual dues, and by neglecting to pay said contribution for *six successive months*, may be dropped from the roll of members. If the annual dues (four dollars) and the annual subscription to the JOURNAL (four dollars) be paid at one and the same time, a reduction of three dollars shall be allowed.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$40.00, or after twenty-five years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. Resignation of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VI. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE VII. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, the following Sections are provided:

1. Scientific Section, with four subdivisions: (a) Chemistry, (b) Botany and Pharmacognosy, (c) Biologic Assays, (d) Bacteriology.
2. Section on Commercial Interests.
3. Section on Practical Pharmacy and Dispensing.
4. Section on Pharmaceutical Legislation and Education.
5. Section on Historical Pharmacy.
6. Women's Section.

Upon the approval of the Council additional Sections may be organized from time to time as necessitated. Each Section, through its officers, shall solicit papers and propose suitable subjects for discussion at the annual meeting, arrange the business of the Section in advance, and perform such duties as may be referred to it. It shall make reports to the Council or Association if requested. The conduct of the work of each Section shall be under by-laws, rules and regulations approved by the Council. All committees proposed or appointed by the Sections shall be subject to the approval of the Council.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of the Council in full or in abstract, act on the report of Council or membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. A Chairman and Secretary shall be elected by ballot by each Section (except the Scientific Section which elects its officers in accord with the by-laws of said Scientific Section) to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE VI. The Chairman of each Section (except the Scientific Section whose officers act in accord with the by-laws of said Scientific Section) shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his section, to be read before the Section at the annual meeting.

ARTICLE VII. The officers of the Section on Commercial Interests shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting; shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of the Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE VIII. The Chairman of the Section on Practical Pharmacy and Dispensing shall appoint a committee of three on pharmacopoeias and formularies to co-operate in the work of the Section by obtaining papers on the subjects of pharmacopoeias and formularies and discussions thereon. The officers shall arrange in advance of the meeting the business to come before the Section.

ARTICLE IX. The officers of the Section on Pharmaceutical Legislation and Education shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines; shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year; shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to them by the Section; shall propose each year a subject for discussion at the meetings of the State Associa-

tions, and, at the following annual meeting of this Association, shall present a report to the section from the State Associations upon the subject proposed.

ARTICLE X. The officers of the Section on Historical Pharmacy shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy; and shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the Section and be available for reference to any one interested.

ARTICLE XI. The Women's Section shall consist of women who are regular members in good standing in the American Pharmaceutical Association, and the women of the families of regular members in good standing, united for the purpose of promoting the aims of the American Pharmaceutical Association and for advancing the interests of women engaged in pharmaceutical pursuits.

ARTICLE XII. The order of business at the first session of each annual meeting shall be as follows:

1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

3. Nineteen members shall constitute a quorum for the transaction of business.

4. The President's Address may then be read, after which the Council shall report the list of properly accredited delegates.

5. Reports of Committees shall be presented, read by their titles, synopsis, or in full, and laid on the table for future consideration.

6. An abstract of the minutes of the Council shall be read at the annual meeting of the Association, and the acts of the Council shall be approved, amended or revised so as to be acceptable to the Association. At any general session, a member may request further information upon any matter reported on by the Council.

7. The President shall call the roll of States, the Territories, District of Columbia, and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association-at-large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

8. Incidental business.

ARTICLE XIII. The order of business at the second general session at each annual meeting shall be as follows:

1. The President shall call the Association to order.

2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.
3. The report of the Committee on Nomination shall be read.
4. Reading of the Minutes of the Council.
5. Reading of the Reports of the Treasurer and General Secretary.
6. Reports of Standing Committees shall be read.
7. Reports of Special Committees shall be read.
8. Incidental business.
9. Adjournment subject to the call of the President.

ARTICLE XIV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVI. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the program. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section. This does not apply to the Scientific Section, which handles its papers in accord with the by-laws of said Scientific Section-

All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by the consent of the Committee on Publication.

ARTICLE XVII. At the last general session of the Association the newly elected officers of the Association shall take their respective places.

ARTICLE XVIII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER X.

Of Committees.

ARTICLE I. There shall be appointed or elected standing committees as follows: A Committee on United States Pharmacopoeia, a Committee on Transportation, and a Committee on Research, each to consist of ten members; a Committee on Pharmaceutical Syllabus, to consist of seven members; a Committee on Time and Place of Meeting; a Committee on Elbert Prize; and a Committee on General Prizes, each to consist of three members; and a Committee on Program.

ARTICLE II. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Scientific Section, shall at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE III. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE IV. The Committee on the United States Pharmacopoeia shall be appointed by the President of the Association as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years, respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopoeia. It shall also note errors of any kind found in the U. S. Pharmacopoeia so as to facilitate and aid the work of the National Committee of Revision of the U. S. P.

ARTICLE V. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul, or Minneapolis, Denver, Baltimore, Cleveland and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

ARTICLE VI. The Committee on Pharmaceutical Syllabus shall be appointed by the president of the Association as follows: one member shall be appointed for seven years, and one for six, five, four, three, two and one years, respectively, each vacancy occurring from expiration of term shall be filled for a term of seven years; other vacancies shall be filled at the annual meetings of the Association for the unexpired terms. This committee shall report to the Association through the Section on Pharmaceutical Legislation and Education, shall be members of the National Committee on Pharmaceutical Syllabus and shall recommend to the Association its proportionate share of the current expenses.

ARTICLE VII. The reports of all committees of the Association must be sent to the General Secretary in time for presentation at the first general session of the annual meeting of the Association.

ARTICLE VIII. The Committee on Program shall consist of the Local Secretary, the General Secretary and the Secretary of the Council. It shall be the duty of the Committee to prepare and submit to the Council the program for the annual meeting so that same can be published in the JOURNAL at least two months in advance of the annual meeting.

ARTICLE IX. The Committee on Pharmaceutical Research shall be elected by the Council, two members to serve for a term of five years, two for a term of four years, two for a term of three years, two for a term of two years, two for a term of one year, and after the expiration of the one-year term two members shall be elected annually for a term of five years, the Committee on Pharmaceutical Research shall endeavor to promote research along pharmaceutical lines and shall advise the Council as to the use of the research funds of the Association.

CHAPTER XI.

House of Delegates.

ARTICLE I. There shall be and hereby is created a House of Delegates to have and to exercise such functions as may be hereafter specified by the Association.

CHAPTER XII.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the ayes and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

CHAPTER XIII.

Local Branches.

ARTICLE I. Local Branches of this Association may be formed whenever it may appear that fifteen members of this Association in good standing, will participate, provided that no more than one such branch shall be formed in any one state, province, district or territory unless such branches shall be formed at a point distant one hundred miles or more from any branch already established in the same state, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association, shall be the same as set forth in ARTICLE I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall enact any article of constitution or by-law to conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time, subject to the provisions of Article V.

ARTICLE V. If within any one calendar year any local branch shall fail to hold at least three stated meetings, the proceedings of which are reported in the JOURNAL, the BRANCH shall be deemed to be suspended and the membership of such branch in the Council shall terminate.

CHAPTER XIV.

Amendments.

ARTICLE I. Every proposition to alter or amend these By-laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-laws.

BY-LAWS OF THE COUNCIL

(Revised to September 1, 1920, inclusive.)

CHAPTER I.

Of the Election of Officers.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of the Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed \$300, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the ayes and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

CHAPTER IV.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, together with the Editor-in-chief of the JOURNAL, the General Secretary, the Reporter on the Progress of Pharmacy and the Treasurer as *ex-officio* members. The Council shall elect the Chairman.

ARTICLE II. The Committee on Publication shall have charge of the editing, publication and distribution of the Report on the Progress of Pharmacy and the JOURNAL of the Association, and such other publications as may be issued, under rules and regulations to be approved by the Council.

ARTICLE III. The Editor-in-chief of the JOURNAL shall be elected annually and shall receive from the Treasurer for his services such compensation as the Council may direct.

ARTICLE IV. The Editor-in-chief of the JOURNAL shall have charge of the editing, publication and distribution of the JOURNAL subject to the rules and regulations of the Committee on Publication.

ARTICLE V. In case of illness or other inability of the Editor-in-chief to carry on the work of the JOURNAL, the Committee on Publication shall be authorized to make the best arrangements possible to continue the work.

CHAPTER V.

Of Committee on Finance.

ARTICLE I. The Finance Committee shall consist of three members and shall each year, previous to January 1, present to the Council for its consideration a list of appropriations to cover the various expenditures of the ensuing fiscal year. No payment shall be made in excess of any of the said appropriations, except by

a special vote of the Council. Provided, however, that the Treasurer is authorized to transfer from one appropriation account to another such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (\$50.00) dollars.

All motions and resolutions involving the expenditure of any sum in excess of \$25.00 shall have the approval of the Finance Committee before being acted upon by the Council.

All appropriations made for any fiscal year shall lapse at the end of the said fiscal year. Provided, however, that accounts properly chargeable against any of said appropriations prior to their expiration, but not received by the General Secretary until after the end of the fiscal year, may be paid from such appropriation, in case the warrant for such payment be drawn not later than twenty days after the expiration of said fiscal year.

CHAPTER VI.

Of Executive Committee.

ARTICLE I. The Executive Committee shall consist of three members of the Council holding no other office, to be elected annually by the Council, and the President, General Secretary, Treasurer, Chairman of the Council and Secretary of the Council. The Chairman of the Council shall be the Chairman of the Committee and the Secretary of the Council the Secretary of the Committee.

ARTICLE II. The Executive Committee shall be the executive body of the Council. It shall make recommendations to the Council for the good of the Association and shall have the power to act for the Council when so directed. The Secretary shall report its actions to the Council. When deemed necessary to the Committee, it shall hold meetings at a convenient place between the times of annual meetings, and the traveling expenses of its members shall be paid.

CHAPTER VII.

Of Committee on Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the application to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Nine members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and the Secretary.

2. Election of the Standing Committees of Council, as follows:

a. Committee on Finance, three members.

b. Committee on Publication, five members.

c. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.

4. Reading the names of candidates for membership.

5. Reading of reports and appointment of committees.

6. New business.

7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council or the Chairman of the Committee may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be ballotted for at the next session of the Council, when, upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

BY-LAWS OF THE SCIENTIFIC SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1920, inclusive.)

SECTION I.

NAME.

ARTICLE I. This organization shall be known as the Scientific Section of the American Pharmaceutical Association.

SECTION II.

MEMBERSHIP.

ARTICLE I. All members of the American Pharmaceutical Association in good standing, who express a desire to do so, by registering their names with the Secretary of the Section, shall become members of the Section.

SECTION III.

OFFICERS.

ARTICLE I. The officers of the Section shall be a Chairman, a First Vice-Chairman, a Second Vice-Chairman and a Secretary, selected from members of the Section.

SECTION IV.

ELECTION OF OFFICERS.

ARTICLE I. The Chairman of the Section shall at the first session appoint a committee of three, who shall report to the Section at the same session two names for each office. At the last session of the Section these names shall be balloted upon, and the one receiving a majority for that particular office shall be declared elected. These shall then be installed and shall hold office for one year or until their successors are duly elected.

ARTICLE II. Officers may be re-elected, but with the exception of the Secretary shall not hold the same office for more than two consecutive years.

ARTICLE III. The Council of the Association shall fill any vacancies that may occur among the officers.

SECTION V.

DUTIES OF OFFICERS.

Chairman and Vice-Chairmen.

ARTICLE I. It shall be the duty of the Chairman to represent the Section in the Council of the Association, to preside at the annual meetings of the Section, appoint all committees of the Section and fill any vacancies when occurring in these committees. He may present an annual address on any subject of interest to the Section that he may deem of sufficient importance.

ARTICLE II. In the absence of the Chairman, the First Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE III. In the absence of the Chairman and the First Vice-Chairman the second Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE IV. In the absence of all three of these officers the Section shall elect a temporary Chairman.

Secretary.

ARTICLE V. The Secretary shall keep a record of the proceedings of the Section, shall send to the members such notice as the business of the Section may require, shall transmit to the General Secretary the names of the officers and committees elected or appointed, and notify the General Secretary of any changes in the personnel of the officers or committees of the Section, and shall furnish the General Secretary a report of the sessions held at the annual meeting. The Secretary, at least two months in advance, shall write to each member of this Section, giving notice of the latest date upon which papers can be accepted for the program.

ARTICLE VI. The Secretary shall be custodian of the records and documents of the Section, as well as of all funds, and shall make all disbursements subject to the approval of the Chairman.

ARTICLE VII. The Secretary shall arrange the program for the annual meeting, and furnish the editor of the JOURNAL of the Association the program for inclusion in the number just preceding the annual meeting.

ARTICLE VIII. The Secretary shall at each annual meeting present a brief report to the Association of the condition within the Section.

ARTICLE IX. In case the Secretary is unable to attend the annual meeting, he shall notify the Council to that effect and the Council shall then appoint a temporary Secretary.

SECTION VI.

MEETINGS.

ARTICLE I. At least three sessions of the Section shall be held at each annual meeting of the Association. Additional sessions may be held at any time during the meeting when the officers of the Section may see fit, and by consent of the Council; provided, however, that these sessions be so arranged that they conflict as little as possible with sessions of other Sections, and that no session be held simultaneously with the final session of the Association.

SECTION VII.

ORDER OF BUSINESS.

ARTICLE I. The order of business at the first session shall be as follows: (1) Chairman's Address; (2) Secretary's Report; (3) Reports of Standing Committees and Committees of the Association which report to this Section; (4) Nomination of Officers; (5) Miscellaneous Business; (6) Reading of Papers.

ARTICLE II. The time of the other sessions shall be taken up with the reading of papers, excepting as provided for in Section IV (Election of Officers) and Section X (Amendments), or to hear the reports of special committees.

ARTICLE III. Provided, however, that discussion of papers may be interrupted at any time to consider matters referred to the Section by the Association in general session or by the Council.

ARTICLE IV. This regular order of business may be suspended at any time during a session, for that particular session, by a three-fourths vote of those present.

SECTION VIII.

EXPENSES.

ARTICLE I. The expense of printing, postage and stationery shall be paid from the Association treasury, but in no case to exceed \$25.00 for one year.

ARTICLE II. Appropriations for expenses other than those named here must be procured by authority of Council through the Chairman of the Section.

SECTION IX.

PAPERS.

ARTICLE I. Original papers on any subject of scientific interest may be accepted at the discretion of the officers of the Section.

ARTICLE II. The complete title and a brief extract of all papers, not to exceed 250 words, must be in the hands of the Secretary in time for inclusion in the program which is published, as provided in Section V, Article 7.

ARTICLE III. Fifteen minutes shall be allowed for the reading of a paper. If the paper is too lengthy to be read in detail within this space of time, it shall be presented in abstract.

ARTICLE IV. Each speaker in the discussion of a paper shall be allowed five minutes, but all such discussion shall be confined to the paper or subject under consideration at that time.

ARTICLE V. The time allowed for presenting a paper or discussion may be extended by unanimous consent of those present.

ARTICLE VI. All papers and reports presented to the Section become the property of the Association and shall be forwarded to the Editor of the JOURNAL immediately following the annual meeting by the Secretary of the Section.

SECTION X.

AMENDMENTS.

ARTICLE I. These by-laws may be amended at the final session of any annual meeting by a two-thirds vote of those present, provided notice of such amendment is given together with the text thereof at any previous session held at that meeting. Amendments must finally be accepted by the Council as not in conflict with the Constitution and By-Laws of the Association.

SECTION XI.

MISCELLANEOUS.

ARTICLE I. Questions not specifically covered by these by-laws shall always be decided in accord with the Constitution and By-Laws of the Association.

BY-LAWS OF THE HOUSE OF DELEGATES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1920, inclusive.)

CHAPTER I.

ARTICLE I. Functions. The House of Delegates shall have and exercise the following functions:

A. To receive and consider the reports of delegates from the bodies which they represent in the House of Delegates and to receive the greetings of fraternal delegates to the Association from other organizations or from departments of the United States Government.

B. Consider and report upon such resolutions and upon such other subjects as may be referred to the House of Delegates by the Council or by the Association in general session, or by the various Sections.

C. Make a final report of the business transacted by the House of Delegates to the Association not later than the last general session at each annual meeting.

D. It shall have the authority to adopt all rules and regulations necessary for the proper conduct of its business and not inconsistent with the Constitution and By-Laws of the Association and the Council.

CHAPTER II.

ARTICLE I. Representation. The membership of the House of Delegates shall consist of three regularly appointed delegates from each state pharmaceutical association, from the District of Columbia Association, and from similar associations in Porto Rico, the Philippines and any other foreign American state, provided, however, that the delegates so appointed will have the privilege of the floor, but not vote, unless they be members of the American Pharmaceutical Association.

Delegates from all other bodies or organizations shall have the privilege of the floor but shall not have the right to vote.

ARTICLE II. Term of Service. The elected or appointed delegates shall hold office for one year, or until the credentials of their successors shall have been approved by the Council.

CHAPTER III.

ARTICLE I. Organization. The first session of the House of Delegates at each annual meeting shall be called to order by the Chairman, or one of the Vice-Chairmen, or the Recording Secretary of the preceding House; or, in the absence of all of these, by the General Secretary of the Association.

ARTICLE II. Voting. Each delegate shall be entitled to one vote. No delegate shall act as proxy of another delegate who has not been seated, nor as delegate for more than one association, organization, or institution.

ARTICLE III. Privileges. Any member of the American Pharmaceutical Association may attend any session of the House of Delegates and shall have the privilege of the floor.

CHAPTER IV.

ARTICLE I. Officers. The officers of the House of Delegates shall consist of a Chairman, two Vice-Chairmen and a Recording Secretary, who shall be elected annually by ballot by the House of Delegates.

ARTICLE II. Duties of Chairman and Vice-Chairmen. The Chairman shall preside at all meetings of the House of Delegates; in his absence, or on account of inability from any cause, the First Vice-Chairman; or, in his absence, the Second Vice-Chairman; or in the absence of the three, a Chairman *pro tempore* shall perform the duties of the Chairman.

ARTICLE III. Duties of the Recording Secretary. The Recording Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the House of Delegates, and deliver the same to the General Secretary of the Association at the annual meeting. The Recording Secretary shall read all papers received for the purpose; shall call and record the ayes and nays whenever they are required to be called; shall notify the Chairman of every special committee of his appointment, giving a list of his colleagues, and stating the business on which the committee is to act, and shall give notice of the time and place of each meeting of the House of Delegates.

ARTICLE IV. The General Secretary of the Association shall, in January of each year, send appropriate blank credentials for delegates to the various bodies entitled to representation in the House of Delegates, notify the said associations of the time when the credentials, properly filled out, shall be returned, and on or preceding the first day of the annual convention shall deliver such credentials to the Recording Secretary. All credentials received after the opening of the convention shall be handed directly to the Recording Secretary.

The General Secretary shall cause all of the proceedings of the House of Delegates annually to be printed in the JOURNAL of the Association, and shall procure a sufficient number of reprints of the same for distribution among the members of the House of Delegates and the officers of the Association. Said reprints shall also contain the by-laws and a list of the members, officers and committees of the House of Delegates.

CHAPTER V.

ARTICLE I. Sessions. The House of Delegates shall hold at least one session during the annual meeting of the Association at an hour previously determined by the Executive Committee and such additional sessions as may be necessary for the transaction of its business.

CHAPTER VI.

ARTICLE I. The Committee on Resolutions. The Chairman shall appoint a Committee on Resolutions consisting of five members, to which shall be re-

ferred all resolutions, and which shall report to the House the results of its deliberation not later than the last session of the House.

ARTICLE II. The Chairman, Vice-Chairmen and Recording Secretary shall constitute an Executive Committee to pass upon the credentials of representatives to the House of Delegates, to arrange the program for the annual meeting, and to perform such other duties as are commonly discharged by executive committees, or which may be referred to them by the Association or by the House of Delegates.

ARTICLE III. Special Committees. The Chairman shall appoint such special committees as may be directed by the House.

CHAPTER VII.

ARTICLE I. Resolutions. All resolutions shall receive a majority of affirmative votes of those present for adoption.

ARTICLE II. Amendments. Every proposition to amend these by-laws shall be submitted in writing at one session of the House and may be balloted upon at the next session, when upon receiving the affirmative vote of three-fourths of the members present it shall become a part of the by-laws.

CHAPTER VIII.

ORDER OF BUSINESS.

The following shall be the Order of Business:

1. Calling Roll of Delegates whose credentials have been approved by the Executive Committee.
2. Appointment of Committee on Resolutions.
3. Reading of communications from the Association, Sections and Council.
4. Calling Roll of Delegations for reports, resolutions and communications all of which shall be in writing.
5. Miscellaneous business.
6. Election and Installation of Officers.
7. Adjournment to a certain time.

BY-LAWS OF THE WOMEN'S SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1920, inclusive.)

ARTICLE I.

Name and Object.

SECTION 1. This Section shall be known as the Women's Section of the American Pharmaceutical Association.

SEC. 2. The object of this Section shall be to emphasize the right and capability of women to engage in pharmaceutical pursuits as a means of livelihood;

to unite the women employed in pharmaceutical pursuits for mutual encouragement and assistance; to labor for the improvement of legislation regulating the registration as pharmacists, of the women employed in the practice of pharmacy in hospitals and other public institutions; to unite the women members of the American Pharmaceutical Association and the women of the families of members of the American Pharmaceutical Association in a Section for social purposes; and to coöperate in the promotion of the general progress of pharmacy and of the American Pharmaceutical Association.

ARTICLE II.

Membership.

SEC. 1. Members of this Section shall consist of the women who are regular members in good standing of the American Pharmaceutical Association, and the women who are of the families of regular members in good standing of the Association.

ARTICLE III.

Officers.

SEC. 1. The officers shall consist of a President, three Vice-Presidents, a Secretary-Treasurer, and a Historian, all of whom shall be elected by ballot annually, and shall hold their respective offices for one year and until their successors shall have been elected and qualified. Their duties shall be such as are prescribed in the parliamentary authority of the Section and in these by-laws.

SEC. 2. It shall be the duty of the President to preside at the annual meeting, to appoint all committees not otherwise provided for, to see that the by-laws are observed, and to perform such additional duties as may be delegated to her by the Section or by the Executive Board.

SEC. 3. It shall be the duty of the Vice-Presidents to preside in their order in the absence of the President, and to perform such additional duties as may be imposed from time to time by the Section or by the Executive Board.

SEC. 4. The Secretary shall keep the minutes of the meetings and the records of the Section and of the Executive Board; shall conduct the general correspondence; shall notify all committees of their appointments and of any special duties which may be imposed; and shall also notify officers not present at the time of their election, of their election.

SEC. 5. The duty of the Treasurer shall be to receive and keep an account of the funds of the Section, and pay them out on the order of the Secretary countersigned by the President.

SEC. 6. It shall be the duty of the Historian to record the progress and activities of women engaged in pharmaceutical pursuits in the several states, and to present a report of the matter accumulated at each annual meeting of the Section.

SEC. 7. An Honorary President for the year may be elected at each annual meeting by a vote of two-thirds of the women who are present.

ARTICLE IV.

Executive Board.

SEC. 1. The Executive Board shall consist of the President and the Secretary *ex officio*, and three elected members, one of them shall be elected by ballot at each annual meeting to serve for three years.

SEC. 2. It shall be the duty of the Executive Board to direct the affairs of the Section in the interim between the annual meetings, to arrange the program for the annual meetings and to perform such additional duties as may be imposed upon it by the Section. The Board shall have authority to conduct its business by mail. All acts of the Executive Board shall be subject to revision by the Section. It shall be the duty of the Chairman of the Board to assign and supervise the work of the Standing Committees so that the work may be definite and uniform.

ARTICLE V.

Standing Committees.

SEC. 1. The Committee on Membership and Press, the Outlook Committee, and the Hospital Committee shall constitute the standing committees of the Section.

SEC. 2. The Committee on Membership and Press shall consist of eleven members of the Section, composed of a Chairman, elected by the Section, and ten active workers, who shall be appointed by the President.

SEC. 3. The Outlook Committee shall consist of nine members of the Section, appointed by the President, whose duty it shall be to investigate and report on the work of the women pharmacists, to investigate the education of women students wishing to take up the study of pharmacy and to cooperate with women's clubs.

SEC. 4. The Hospital Committee shall consist of four members of the Section, appointed by the President, whose duty it shall be to investigate and report on conditions of pharmacists in institutional pharmacy.

SEC. 5. The members of all special committees shall be appointed by the President, unless the Section shall prefer to elect.

ARTICLE VI.

Meetings.

SEC. 1. The Section shall hold one regular annual meeting during the annual meeting of the American Pharmaceutical Association, and such additional meetings or sessions as the Section shall determine.

SEC. 2. On the first day of the annual meeting the President shall appoint from the members of the Section a nominating committee of five, and not less than four tellers, to count and report the ballots at the annual election. The Nominating Committee shall report on the same day or a succeeding day, as the Section may direct, nominations for all the officers, for the member of the Exe-

cutive Board, and for Chairman of the Committee on Membership and Press. Additional nominations may be made from the floor. The elections shall be by ballot, unless, where there is but one candidate for an office, it is dispensed with by unanimous consent. The officers elected who are present shall be installed at the close of the annual meeting.

SEC. 3. Special meetings of the Section may be called by the President at her discretion, and shall be called by her upon written request of the Executive Board, or upon the written request of any five members of the Section.

SEC. 4. Seven members shall constitute a quorum at any meeting of the Section.

ARTICLE VII.

Parliamentary Authority.

Except as herein provided, the proceedings of the Section shall be governed by the general rules of parliamentary law as stated in Robert's Rules of Order, Revised.

ARTICLE VIII.

Amendments.

Amendments to these by-laws shall be proposed in writing at one meeting and balloted for upon a subsequent day, when upon receiving the vote of two-thirds of the members present, they shall become a part of the by-laws.

GENERAL RULES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1920, inclusive.)

Rule 1. Advertisements for Publications: At the forty-seventh annual meeting (1889), the Council resolved that no advertisements be solicited or accepted for any of the publications or programs issued by or in the name of the Association, and the General Secretary was instructed to inform annually the Local Secretary and pharmaceutical press of the resolution.

Rule 2. Term of Council Members from Local Branches: At the 55th annual meeting (1907), it was ordered that the three-year term of members of the Council elected by Local Branches of the A. Ph. A. shall date from the last annual meeting of the Association held previous to the date of election of the new Council members by a Local Branch.

Rule 3. Proceedings of National Association of Boards of Pharmacy and American Conference of Pharmaceutical Faculties in A. PH. A. JOURNAL: That space be annually set aside in the JOURNAL of the American Pharmaceutical Association for abstracts of the Proceedings of the meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties.

Rule 4. Salary Year of Officers: At the fifty-seventh annual meeting (1909), it was ordered that the salary year of the officers of the American Pharmaceutical Association be changed so as to run from July of one year to July of the next year, instead of, as heretofore, from September to September.

Rule 5. Names of Life Members: At the fifty-seventh annual meeting (1909) it was ordered that the names of life members, new style, be designated in the published Roll and List of Members by means of heavy-faced or black-faced type.

Rule 6. Approval of Application for Membership: At the fifty-eighth annual meeting (1910), it was ordered that the Committee on Membership submit all names of applicants for membership to the respective State representative on the committee for approval before sending the application to the Secretary of the Committee on Membership for submission to the vote of the Council, or if they be sent direct to the Secretary of the Committee on Membership, they shall be sent by him first to the State representative for approval. The Secretary of the Committee on Membership shall have discretionary power in the application of this rule.

Rule 7. Resignation of Members: At the fifty-eighth annual meeting (1910), it was ordered that the resignation of a member may be accepted during the first six months of the fiscal year for which his annual dues are payable.

Rule 8. Address of Welcome at Opening General Session: Address of welcome and responses thereto at the opening general session shall be omitted.

Rule 9. Meetings of Council: The meetings of the Council shall be held in the evenings with the exception of the first and the last sessions.

Rule 10. Time of Section Meetings: The work of the various Sections shall start promptly in the morning at 9.30 o'clock, lasting until 12 o'clock, and in the afternoon at 2 o'clock, lasting until 5 or 6 o'clock.

Rule 11. Section and Association Meetings: The Section and Association meetings shall be confined to mornings and afternoons.

Rule 12. Concurrent Meetings of Sections: The principle of concurrent meetings of the Sections shall be established. There shall be used a series of bulletins in the section rooms notifying members what papers are being read and discussed in the different several Sections.

Rule 13. Manuscripts for Section Meetings: The chairmen of the Sections shall use every endeavor to secure all manuscripts within four weeks of the annual meeting, and shall immediately send them to the General Secretary.

Rule 14. Printing of Accepted Manuscripts: The General Secretary shall have accepted manuscripts printed in advance of the annual meeting, whenever in the judgment of the Chairman of the Section and the General Secretary it is desirable.

Rule 15. Collective Program of Sections: With all manuscripts in hand three or four weeks before the annual meeting, the General Secretary shall prepare a collective program containing the detailed programs of the different Sections and indicating at what particular session any given paper shall come up for **reading and discussion.**

Rule 16. Editor as Historian: The Editor-in-chief of the JOURNAL shall be *ex-officio* Historian of the Association.

GENERAL RULES OF FINANCE OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1920, inclusive.)

Rule 1. Deposits of Moneys of Funds: The Treasurer shall deposit all moneys received by him except, those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee and approved by the Council.

Rule 2. Payments of Moneys of Funds: Said moneys shall be deposited in the name of the American Pharmaceutical Association, and shall be paid out by numbered checks drawn by the Treasurer, on written warrant signed by the General Secretary.

Rule 3. Payment of Bills: The correctness of every bill shall be certified to by the person contracting the same and the General Secretary, and the latter shall note on the bill the appropriation against which the same is to be charged. The bill shall then be submitted to the Chairman of the Committee on Finance for approval, before payment is made. A warrant shall then be drawn and signed by the General Secretary, upon receipt of which, together with the original bill and voucher, the Treasurer shall draw a check for the amount.

Rule 4. Deposits in Banks: The Treasurer shall make a daily deposit in bank whenever his receipts amount to \$100 or more.

Rule 5. Custodian of Funds: The Treasurer shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him.

Rule 6. Appointment of Auditing Committee: There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town as that in which the Treasurer resides, the Chairman to be named by the Chairman of the Council.

Rule 7. Annual Report of Treasurer, General Secretary and Editor: The Treasurer, General Secretary and Editor shall balance their books on January 1st of each year and shall make out previous to the fifteenth day of February following, their annual reports for the financial year just closed.

Rule 8. Auditing of Accounts of Treasurer, General Secretary and Editor: The Treasurer, General Secretary and Editor having thus balanced their books and made out their reports, shall place all such books, accounts, vouchers, etc., with the reports, at the disposal of the Chairman of the Auditing Committee at such time and place in February of each year as the said Chairman may direct.

Rule 9. Return of Books to Treasurer, General Secretary and Editor: Said books, accounts, vouchers, saving-bank books and accounts of the same shall be returned to the Treasurer, General Secretary and Editor, respectively, within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Rule 10. Meeting of Auditing Committee: There shall be a meeting of the Auditing Committee in February of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., received by them; and previous to the first day of March following, to make a report thereon, in writing, to the Chairman of the Council.

Rule 11. Expense of Bonds of Treasurer and General Secretary: The expense of the bonds of the Treasurer and General Secretary given by a Trust Company, shall be paid for from the Treasury.

Rule 12. Merging of Balances: All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

Rule 13. Committee on Invested Savings and Trust Funds: The Chairman of the Council is instructed to appoint three members of the Association who, together with the Treasurer, shall be known as the Committee on Invested, Savings and Trust Funds.

Of the three members first appointed, one shall be appointed for one year, one for two years and one for three years. Each year thereafter, one member shall be appointed for three years. Members of the Committee need not be members of the Council.

It shall be the duty of said committee to carefully consider the nature and status of all invested, savings and trust funds of the Association, and to make an annual written report upon the same to the Council, which report shall be read (in full) at one of the general sessions of the annual convention of the Association, and published (in full) in the annual volume of Proceedings thereof.

The present custody of the funds shall not be affected by the adoption of these resolutions, neither shall the committee have the power to invest or re-invest any of such funds, except as instructed by the Council or Association.

Rule 14. Disposal of Receipts from the National Formulary: The Treasurer shall keep a separate and accurate account of all receipts of and disbursements, for the National Formulary. Any balance of receipts in excess of disbursements, remaining at the end of any fiscal year, after making due allowance for any outstanding indebtedness on behalf of the National Formulary, shall be credited as follows: Fifty per cent. to the general funds of the Association as partial repayment for that portion of the overhead charges of the Association incurred on behalf of the National Formulary; and the remaining fifty per cent. to the credit of the American Pharmaceutical Association Research Fund. This fund is to be held as a permanent fund by the American Pharmaceutical Association through its Council or controlling body.

Until such time as the American Pharmaceutical Association Research Fund has accumulated from this source or from bequests, contributions, etc., a fund of not less than one hundred thousand (\$100,000.00) dollars, the Council may expend not more than fifty per cent. of the net income of said Fund. When this Research Fund shall exceed one hundred thousand (\$100,000.00) dollars, then the Council may expend annually a sum not exceeding the income derived from the investments held by the said Research Fund.

From the funds thus available, the Council may grant such honorariums or awards to encourage investigation and research upon any subject relating in

any way to pharmacy or to the collateral sciences as may in their judgment be deemed proper. In the granting of such honorariums or awards, preference shall be given to such applications or subjects as are recommended by the committees of Revision of the United States Pharmacopoeia or the National Formulary.

Rule 15. Depository of the American Pharmaceutical Association Research Fund: That the selection of the depository and all investments of the funds of the American Pharmaceutical Association Research Fund shall be made by the Treasurer and the Committee on Finance.

Rule 16. Designation of Safe Deposit Vaults for Funds and Securities: That the Committee on Invested and Trust Funds shall annually recommend to the Council the banks and safe deposit vaults in which the funds and securities, respectively, of the Association shall be kept for the ensuing year.

GENERAL RULES OF PUBLICATION

(Revised to September 1, 1920, inclusive.)

1. Approval and Payment of Bills of JOURNAL: All bills on account of the JOURNAL shall be certified to by the Editor and sent as soon as possible to the Chairman of the Committee on Publication for approval and then sent by the latter to the General Secretary for payment in accordance with Article II, Chapter V, of the by-laws and Rule 3, of the General Rules of Finance except bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the office of the JOURNAL (Petty and Clerical Expenses, JOURNAL Office), which shall be paid as provided for in Rule 2 of these rules.

2. Bills for Petty and Clerical Expenses, JOURNAL Office: Bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the Office of the JOURNAL (Petty and Clerical Expenses, JOURNAL Office) shall be paid by check by the Editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION out of a deposit of \$300 to be made to the credit of the Editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION in a bank to be approved by the Committee on Publication. The Editor shall be bonded for \$500 at the expense of the Association.

The procedure for the payment of such bills shall be as follows: (1) at the end of each month, the Editor shall send all paid-and-receipted bills and cancelled checks, with an itemized bill or statement, to the Chairman of the Committee on Publication for approval; (2) after approval, the Chairman of the Committee on Publication shall send the bills and checks to the General Secretary for payment in accordance with Article II, Chapter V, of the by-laws and Rule 3 of the General Rules of Finance; and (3) the Treasurer shall send the Editor a check to cover the amount of the bills and thus increase the bank balance.

3. Bills for Year Book, National Formulary and Publications: All bills on account of the Year Book, National Formulary and other publications of the Association shall be certified to by the person contracting the same and approved by the Chairman of the Committee on Publication and sent by the latter to the General Secretary before payment in accordance with Article II, Chapter V, of the by-laws, and Rule 3 of the General Rules of Finance.

THE FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to January 1, 1921.)

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are six Permanent Funds, a General Fund, and three Trust Funds at the present time.

The Permanent Funds are (1) Life Membership; (2) Ebert Prize; (3) Centennial; (4) Endowment; (5) Ebert Legacy; (6) American Pharmaceutical Association Research Fund.

THE A. PH. A. LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named a revised Constitution was reported by a committee, and after consideration, adopted (see Proceedings, 1856, pp. 12, 14, 27 and 79), Article II, Section 7 (afterwards Section 8), containing the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings, 1870, pp. 87-96) and this, with a few slight amendments adopted in 1896 and 1900, read as follows:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses."

In 1913 this article was amended to read as follows and is now in force:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses."

Chapter VI, Article 5, of the By-Laws adopted the same year, read as follows: "Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and 1896 and again in 1906 and changed to Article IV, Chapter VIII. As now in force, it reads as follows:

"Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$40.00, or after twenty-five years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (p. 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one (until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings, 1879, p. 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, p. 52), again in 1896 (Proceedings, p. 17), and again in 1906 (Proceedings, p. 100), so as to apply to those who have been members for over twenty years (see Chapter VIII, Article IV, of the By-Laws). Under this clause the life membership (new style) of the present roll is one hundred and sixteen.

The Treasurer's report for 1880 (p. 524) states the life membership fund to be \$75, for 1881 (p. 513) \$613, for 1882 (p. 608) \$685, for 1883 (p. 436) \$904.38, and for 1884 (p. 524) \$944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that \$316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund to be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147) it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of \$3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471) the Association ordered again a transfer to the same fund of \$4,000.

From 1887 to 1909 the annual reports of the Chairman of the Council give the number of each bond of the registered securities in which the Life Membership Fund is invested. Since 1910 the Treasurer has made this report. By vote of the Association, the name of this fund was changed to the William Procter, Jr., Fund on September 15, 1902 (see Proceedings, 1902, p. 214), but was changed back to its original name, Life Membership Fund, on September 5, 1906 (see Proceedings, 1906, p. 100). The report of the Treasurer of the Association shows that on January 1, 1921, the value of the Life Membership Fund was \$26,075.66, of which sum the interest for any current year only may be used by the Association for its expenses. Massachusetts State Bonds to the amount of \$13,000 and \$12,000 of Liberty Bonds are in this fund (securities given at face value).

THE EBERT PRIZE FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated for *conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing

other meritorious contributions to knowledge; or for IMPROVED METHODS of determining merit, for the preparation of chemical or pharmacal products; the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; provided, that in case none of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, p. 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Charles L. Mitchell; for 1877, to Fred B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897, to Albert B. Prescott and Jas. W. T. Knox; for 1898, to Virgil Coblenz; for 1899, to Henry Kraemer; for 1900, to Edward Kremers and Oswald Schreiner; for 1902, to J. O. Schlotterbeck and H. C. Watkins; for 1903, to Fred B. Power; for 1905, to Dr. Ernest Schmidt, of Germany; for 1906, to J. O. Schlotterbeck and H. C. Watkins; for 1907, to Fred B. Power and Frank Tutin; for 1908, to A. B. Stevens and L. E. Warren; for 1909, to Henry Kraemer; for 1910, to Harry M. Gordin; for 1911, to W. A. Puckner and L. E. Warren; for 1915, to E. N. Gathercoal; for 1916, to John Uri Lloyd; for 1919 to Arno Viehover; for 1920 to Geo. D. Beal.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to \$683.43. From 1887 to 1909 the reports of the Chairman of the Council specify the securities in which this fund is invested. Since 1910 the report has been made by the Treasurer. The annual interest must be applied to a prize for an original investigation meeting the requirements stated above.

In accordance with the recommendation of the committee on invested savings and trust funds, submitted and adopted at the fifty-eighth annual meeting (see Proceedings, 1910, p. 454) the name of the Ebert Fund was changed to Ebert Prize Fund, and the amount of the prize limited to \$25.00 until the excess of interest above the sum annually awarded and added to the principal shall amount to \$1,000.00, after which the entire annual interest upon the same shall constitute the Ebert Prize. On January 1, 1921, the Fund was \$1,262.40. Of this amount \$1,200 is in Liberty Bonds.

THE A. PH. A. CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left which by subsequent collections made in Philadelphia was increased to \$525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund to aid in the prosecution of original investigations, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526-528), and adopted the name *Centennial Fund*.

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings, 1880, p. 553) when \$582.81 had thus been received.

In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII (Proceedings, 1881, pp. 190, 549). Members have not availed themselves of this fund to the extent contemplated at its foundation; for the amounts paid out have been only \$7.50 to Robt. B. Warder for material used for investigations reported in 1885; \$96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings, 1889, p. 16); and \$32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892; \$50 to the same investigator in 1893, and \$50 again to the same investigator in 1894. In 1896 the sum of \$22.33 was paid to the Committee on Indicators for material used in their investigations. In 1915 the sum of \$100 was paid Edward Kremers for research work on cultivation of medicinal plants.

The original sum of \$1107.81 (\$525 + \$582.81) had increased in 1883 to \$1232.76. From 1887 to 1909 the securities in which the fund is invested are specified in the reports of the Chairman of the Council. Since 1910 the reports have been made by the Treasurer. The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science. The value was \$3,557.85 (face value of securities only given) on January 1, 1921. The amount of this Fund for Jan. 1, 1920 was \$3,423.51 instead of \$4,423.51 as given on page lvi, Vol. 7 of the Year Book. The Fund has \$1,000 Massachusetts State Bond, \$2,400 Liberty Bonds.

THE A. PH. A. ENDOWMENT FUND.

At the fifty-fourth annual meeting held at Indianapolis, Ind., September, 1906, Messrs. Samuel A. D. Sheppard and James H. Beal proposed the establishment of a permanent fund to be known as the "Endowment Fund" (see Proceedings, 1906, p. 99) under the following conditions:

"That the said S. A. D. Sheppard and James H. Beal jointly agree to pay into said fund one dollar for each twenty dollars contributed and paid into said fund by all other members of this Association up to and until such Endowment Fund shall, with its accumulations of interest, reach the sum of twenty-five thousand (\$25,000) dollars.

"That as money shall be received as additions to said fund the same shall be invested in such securities as the Council may direct until the interest and other accumulations, together with the amount of the principal, shall reach the sum of twenty-five thousand (\$25,000) dollars.

"That when the Endowment Fund shall have reached the sum of twenty-five thousand (\$25,000) dollars one-half the income derived therefrom may be used for any purpose deemed wise by the Association.

"That when said Endowment Fund, inclusive of donations, interest and other accumulations, shall amount to the sum of fifty thousand (\$50,000) dollars, the Association may use ninety per cent. of the income therefrom for any purpose deemed wise by the Association.

"That under no circumstances whatever shall all the income from said fund be used, but at least ten per cent. thereof shall be annually added to the principal of the Endowment Fund.

"That under no circumstances whatever shall the principal or any part thereof be used for any purpose except investment for income, nor pledged for any debt or obligation of the Association, or any person, nor used for any other purpose or in any other manner than as specified."

Contributions to the Endowment Fund have been made at different times, and the names of the contributors published in the annual volume of *Proceedings* (see *Proc.*, 1907, pp. 47 and 48; *Proc.*, 1908, pp. 476 and 477; *Proc.*, 1909, p. 464; *Proc.*, 1910, p. 478). According to the Treasurer's report, the total amount contributed and interest accumulations up to January 1, 1921, was \$8,385.37. The Fund has \$8,000 in Liberty Bonds.

THE EBERT LEGACY FUND.

The late Albert E. Ebert having by his will designated the A. Ph. A. as residuary legatee of his estate, it was ordered at the fifty-eighth annual meeting on recommendation of the Committee on Invested Savings and Trust Funds, that the money received from the estate be converted into a fund to be known as the Ebert Legacy Fund, and that this fund be invested in municipal or other public bonds approved by the Committee on Invested Savings and Trust Funds and the Finance Committee, and that this fund be kept intact and the income added thereto until the fund and its accumulation shall together amount to a total of \$10,000.00

When this sum has been reached, the income derived from the fund shall be devoted to such purposes as will in the opinion of the Council best commemorate the founder of the fund and his services to pharmacy.

The reason for the suggestion that the Ebert Fund and the Ebert Legacy Fund be kept separate was, that the first was given by Mr. Ebert for a specific purpose, while the latter was given to the Association practically without restriction and with the evident intention that the Association should use it in the manner which it deemed best.

On December 14, 1909, the executors of the Ebert estate paid over to the Treasurer of the A. Ph. A. the sum of \$2,800.00, which has been deposited in the International Bank of St. Louis at Interest. The Treasurer's report states that January 1, 1921, this fund amounted to \$4,923.32. The Fund has \$2,000 in St. Louis City Bonds and \$2,700 in Liberty Bonds.

AMERICAN PHARMACEUTICAL ASSOCIATION RESEARCH FUND.

The Association at the 1915 meeting took the first action resulting in this fund. It was then decided to make the net balance each year in the National Formulary account a part of the Endowment Fund (see *JOURNAL A. PH. A.*, November, 1915, p. 1376). The following rule was adopted:

"Rule 14. Disposition of Receipts from National Formulary: The Treasurer shall keep a separate and accurate account of all receipts and disbursements for the National Formulary. Any balance of receipts in excess of disbursements remaining at the end of any fiscal year shall be credited to the Endowment Fund and become a part thereof."

The Committee on Publication at the 1916 meeting recommended the modification of Rule 14, and the establishment of a National Formulary Revision and Research Fund (see *JOURNAL A. PH. A.*, October, 1916, pp. 1142 and 1144, and November, 1916, p. 1280). This resulted in the appointment of a committee to report at the 1917 meeting. Under these conditions no money was paid into the Endowment Fund under Rule 14.

The net amount to the credit of the National Formulary IV during the year 1916 was \$13,903.67 (see *JOURNAL A. PH. A.*, August, 1917, p. 749).

At the 1917 meeting the Association changed Rule 14 to read as follows (see *JOURNAL A. PH. A.*, December, 1917, p. 1100):

"Rule 14. Disposal of Receipts from the National Formulary: The Treasurer shall keep a separate and accurate account of all receipts of and disbursements for the National Formulary. Any balance of receipts in excess of disbursements, remaining at the end of any fiscal year, after making due allowance for any outstanding indebtedness on behalf of the National Formulary, shall be credited as follows: Fifty per cent. to the general funds of the Association as partial repayment for that portion of the overhead charges of the Association incurred on behalf of the National Formulary; and the remaining fifty per cent. to the credit of the American Pharmaceutical Association Research Fund. This fund is to be held as a permanent fund by the American Pharmaceutical Association through its Council or controlling body.

"Until such time as the American Pharmaceutical Association Research Fund has accumulated from this source or from bequests, contributions, etc., a fund of not less than one hundred thousand (\$100,000.00) dollars, the Council may expend not more than fifty per cent. of the net income of said Fund. When this Research Fund shall exceed one hundred thousand (\$100,000.00) dollars, then the Council may expend annually a sum not exceeding the income derived from the investments held by the said Research Fund.

"From the funds thus available, the Council may grant such honoraria or awards to encourage investigation and research upon any subject relating in any way to pharmacy or to the collateral sciences as may in their judgment be deemed proper. In the granting of such honoraria or awards, preference shall be given to such applications or subjects as are recommended by the committees of Revisions of the United States Pharmacopoeia or of the National Formulary."

In accordance with instructions of the association (see JOURNAL A. Ph. A., December, 1917, p. 1100) the Treasurer transferred 50 per cent. of the National Formulary Research Fund to the American Pharmaceutical Association Research Fund and 50 per cent to the general funds of the Association. This with the interest gave the A. Ph. A. Research Fund \$7,043.31. To this has been added \$4,059.24 from the National Formulary IV account for 1917, \$1,976.49 for 1918 and \$2,226.77 for 1919. The interest increased this to \$16,542.86 on January 1, 1921. The Fund has \$14,100 in Liberty Bonds.

THE A. PH. A. GENERAL FUND.

On February 26, 1909, the Council directed that \$5,000.00 of the current funds of the Association be invested by the Treasurer in some interest-bearing security, to be approved by the Finance Committee and the Chairman of the Council (see Proc., 1909, p. 449). In accordance with this order the Treasurer reported on May 26, 1909, having purchased five \$1,000.00 St. Louis, Mo., 4 per cent. bonds at 103 $\frac{5}{8}$ and accrued interest. Again, on November 15, 1909, the Treasurer, in accordance with an order of the Council (see Motion No. 11, p. 449), invested \$5000.00 of the current funds of the Association in St. Louis public buildings and public works 4 per cent. gold bonds.

TRUST FUNDS.

The following funds are held in trust by the A. Ph. A.: (1) Wm. Procter, Jr., Monument; (2) College Prize; (3) Rice Memorial; (4) Jos. P. Remington Honor Medal Fund.

THE WM. PROCTER, JR., MONUMENT FUND.

At the fifty-second annual meeting held at Kansas City, Mo., September, 1904, it was resolved to solicit subscriptions for a memorial monument to be erected in the Smithsonian Grounds at Washington, D. C., to the memory of William Procter, Jr., if possible in 1917, the centennial anniversary of his birth. A committee was appointed to take the matter in charge, which since that time has been active in soliciting subscriptions. The names of contributors have been published from time to time in the annual volume of Proceedings (see Proc., 1906, p. 63; Proc., 1907, p. 98).

In September, 1907, at the annual meeting held in New York City, the Association directed that all moneys collected for the William Procter, Jr., Monument Fund be turned over to the Treasurer of the A. Ph. A. to be deposited on interest for the benefit of said fund (see Proc., 1907, p. 99). The Treasurer of the A. Ph. A., in his annual report for 1908—1909, reports having received on January 27, 1909, the sum of \$3,413.33 from the Treasurer of the Committee, Benj. T. Fairchild, which was placed on time deposit in the International Bank of St. Louis, Mo., for a period of twelve months at 4 per cent. per annum (see Proc., 1909, p. 472). This certificate has been renewed annually. The total sum to the credit of this fund, according to the Treasurer's report on January 1, 1921, amounted to \$10,140.44. The Fund has \$9,700 in Liberty Bonds.

RICE MEMORIAL FUND.

A joint committee was appointed by the Chairman of the Committee of Revision of the U. S. P., on June 26, 1901, to report to the Board of Trustees and Committee of Revision upon a suitable plan for honoring the memory of Dr. Charles Rice.

It was decided, after hearing the report of the Committee, to erect a monument over Dr. Charles Rice's grave and to prepare a memoir containing a biographical sketch of his life.

The monument over the grave was dedicated July 7, 1903, with the members of the Board of Trustees among those present. The memoir, a volume of sixty-four pages, was published and distributed in 1904.

March 22, 1905 (see Item No. 428 in Abstract of Minutes of Board of Trustees 1900-1910), on motion of Dr. H. C. Wood, the balance of the Rice Memorial Fund was accepted as voted by the Revision Committee and the Chairman was requested to appoint a committee of one, to be known as the Rice Memorial Committee, to take charge of this fund and deposit it in the name of the Board of Trustees of the U. S. P. Convention. This motion was carried and the Chairman appointed Mr. S. A. D. Sheppard to constitute the committee.

Under date of November 22, 1910, Dr. A. R. L. Dohme, representing his father Dr. Charles E. Dohme, the retiring chairman of the Board of Trustees, turned over to Chairman James H. Beal, of the present Board, bank-book No. 55828, of the Boston Penny Savings Bank, with an account, amounting to one hundred and forty-nine dollars and forty-three cents (\$149.43) to its credit on October 1, 1910, the same standing in the name of Samuel A. D. Sheppard, Committee of Trustees, of the United States Pharmacopoeial Convention.

June 6, 1913, the Board of Trustees of the U. S. P. C. inquired of the A. Ph. A. whether the organization would accept the custodianship of the Rice Mem-

orial Fund (U. S. P. C. Board of Trustees minutes, Item 488, p. 365). The Council of the A. Ph. A. voted to accept the Fund in trust.

The transfer was made November 22, 1913, the amount being \$168.21.

January 1, 1919, the fund amounted to \$183.65.

On recommendation of the Treasurer this fund amounting to \$194.68 was transferred to the Endowment Fund (see A. Ph. A. JOURNAL, October, 1919, p. 861).

THE COLLEGE PRIZE FUND (MOTTER FUND).

On August 4, 1905, Dr. Murray Galt Motter, of Washington, D. C., placed in the treasury of the American Pharmaceutical Association the sum of \$25.00, the same to be awarded as prizes by the National College of Pharmacy to the members of the classes of 1906, 1907, 1908, 1909, 1910 of said College.

This money, deposited in the Boston Penny Savings Bank in the name of the Treasurer of the A. Ph. A., is held as a special fund, to be drawn upon as the prize students shall be named by the National College of Pharmacy and their applications for membership in the American Pharmaceutical Association shall be approved.

Up to the present time no demands have been made on the Fund. January 1, 1919, the Fund amounted to \$41.71.

On recommendation of the Treasurer this Fund amounting to \$43.47 was transferred to the Endowment Fund (see JOURNAL A. Ph. A., October, 1919, p. 861).

JOSEPH REMINGTON HONOR MEDAL.

At the April 8, 1918, meeting of the New York Branch of the A. Ph. A., a special committee reported the following recommendations which were adopted by the Branch and later by the Council of the A. Ph. A.:

"That a gold medal to be known as the Joseph P. Remington medal and suitably engraved be awarded to the man or woman who has done most for American Pharmacy during the preceding year or whose efforts during a number of years have culminated to a point during the preceding year where the result of these efforts would be considered as being the most important and advantageous for American Pharmacy. That no bar be placed as to the candidate's profession or kind of work accomplished.

"That the Special Committee on the Pharmacy Honor Medal be empowered, in order to make the presentation of this award permanent and perpetual, to raise a fund of \$1000.00 and in addition sufficient money to pay the initial expenses of die, postage, etc. That this money be raised by obtaining a contribution of \$100.00 from the Branch treasury and the rest to be made up by voluntary contributions from the members and firms in New York City and vicinity. That the \$1000.00 fund be invested in Liberty Bonds, which bonds are to be held in trust by the Treasurer of the American Pharmaceutical Association.

"That the medal be awarded by a standing committee consisting of all the past presidents of the American Pharmaceutical Association, and in case the number of living past presidents is less than five the senior past vice-presidents of the American Pharmaceutical Association are to be drawn upon in sufficient number to create a committee of five. The Secretary of the New York Branch is to act as Secretary of this standing committee.

"That the medal be presented by the Senior Past President of the Local Branch or in his inability to do so by other past-presidents in the order of their seniority.

"That the New York Local Branch of the American Pharmaceutical Association take the matter in hand to the extent of devoting the regular April meeting annually to the presentation of this medal."

The first Remington Honor Medal was awarded to James Hartley Beal, the second to John Uri Lloyd.

On January 1, 1921, the Fund was \$1,157.04 of which \$1100.00 is invested in a Liberty Bond.

ASSOCIATION BONDS ARE REGISTERED.

All bonds of the Association are registered in the name of the American Pharmaceutical Association and kept in the Association safe deposit box.

For a detailed account of each of the funds of the Association, see the annual reports of the Treasurer published in the JOURNAL of the A. Ph. A. for previous years and in this volume for the fiscal year 1919.

HENRY M. WHELPLEY, *Treasurer.*

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

January 1, 1919 to January 1, 1920.

BY HENRY M. WHELPLEY, ST. LOUIS, MO.

RECEIPTS.

St. Louis 4% Registered Bonds on hand—January 1, 1919 (General Fund).....		\$10,000.00
Cash on hand, January, 1, 1919 (Current Account).....		\$17,740.42
Cash on hand, January 1, 1919 (National Formulary IV).....		1,976.49
		<hr/>
		19,716.91
Annual Dues and Journal, 1917... \$	10.00	
Annual Dues and Journal, 1918	90.00	
Annual Dues and Journal, 1919	7,430.00	
Annual Dues and Journal, 1920	5,600.00	
Annual Dues and Journal, 1921	20.00	
Annual Dues and Journal, 1922	5.00	
	<hr/>	\$13,155.00
Annual Dues only, 1919.....	80.00	
Annual Dues only, 1920.....	36.00	
	<hr/>	
		116.00
Miscellaneous Annual Dues.....		1.00
Paper Certificate of Membership		3.00
Parchment Certificates of Membership, 2 at \$5.00.....		10.00
Proceedings, Miscellaneous.....		127.05
Bulletin.....		12.00
Year Book (I, II, III, IV, and V)...		140.20
Journal Advertising.....	5,201.15	
Journal Subscriptions.....	367.16	
Journals (Bound volumes).....	15.00	
Reprints.....	483.43	
Type Cuts.....	2.25	
Index.....	9.00	
Waste Paper.....	7.50	
Express Refund.....	1.77	
Gold Badges and Bars.....	34.70	
Gold Buttons.....	10.00	
Gold Pins.....	9.00	
Plated Buttons.....	1.25	
Plated Pins.....	.25	
Bank Exchange—paid with dues . \$	.85	

From Research Fund for Research work.....	240.00
Interest on deposit in International Bank of St. Louis.....	607.94
Interest on St. Louis City Bonds..	400.00
National Formulary II.....	1.20
National Formulary III.....	1.35
	<hr/>
	\$20,958.05
National Formulary IV.....	7,050.13
Current Funds in Boston Penny Savings Bank.....	15,000.00

THE A. PH. A. PERMANENT FUNDS, JANUARY 1, 1920.

Life Membership Fund.....	\$ 2,670.74
Ebert Prize Fund.....	1,203.14
Centennial Fund.....	2,550.87
Endowment Fund.....	1,388.60
Ebert Legacy Fund.....	894.13
A. PH. A. Research Fund.....	9,222.68
	<hr/>
	\$17,930.16

FUNDS HELD IN TRUST BY A. PH. A.

Procter Monument Fund.....	\$ 2,018.00
College Prize Fund.....	1.76
Rice Memorial Fund.....	102.63
Jos. P. Remington Honor Medal Fund.....	42.68
	<hr/>
	\$ 2,165.07

Total Receipts.....	<hr/>	\$48,103.41
Grand Total.....		\$92,820.32
Soldier's and Sailor's Fund (this is an A. Ph. A. Committee Fund) ..		2,095.91

DISBURSEMENTS BY VOUCHER CHECKS.

Jan.	10.	Check 3149 Wm. B. Day.			
		Clerical.....	\$	40.00	
		Printing, postage and stationery	10.00	\$	50.00
"	"	" 3150 E. G. Eberle.			
		Salaries.....		312.50	
		Journal (a).....		36.70	
		Journal (c).....		10.11	359.31
"	"	" 3151 Eschenbach Printing Co.			
		Journal (a).....		505.83	
		Journal (c).....		16.44	
		Journal (a).....		26.50	548.77
"	"	" 3152 J. B. Lippincott Co.			

			National Formulary IV.....		132.50
"	"	"	3153 Lloyd Bros.		
			Miscellaneous.....		75.00
"	"	"	3154 Wm. B. Day.		
			Miscellaneous.....		163.49
"	"	"	3155 Wm. B. Day.		
			Miscellaneous.....		40.00
Feb.	3	"	3156 E. F. Greathead		
			Printing, postage and stationery		12.20
"	11	"	3157 E. G. Eberle.		
			Salaries.....	312.50	
			Journal (a).....	22.34	
			Journal (b).....	53.30	
			Journal (c).....	16.00	404.14
"	"	"	3158 Eschenbach Printing Co.		
			Journal (a).....		476.06
"	"	"	3159 Wm. B. Day.		
			Printing, postage and stationery	10.00	
			Clerical.....	40.00	
			Miscellaneous.....	2.32	
			Year Book.....	1.71	54.03
"	26	"	3160 W. F. Robinson.		
			Committee on Membership.....		6.50
March	1.	"	3161 John Block.		
			Certificates.....		5.00
"	"	"	3162 H. M. Whelpley.		
			Printing, postage and stationery	33.52	
			Miscellaneous.....	31.70	65.22
"	7.	"	3163 Wm. B. Day.		
			Clerical.....	32.99	
			Miscellaneous.....	11.32	
			Year Book.....	.20	43.52
"	"	"	3164 Louis C. Hesse.		
			Printing, postage and stationery		6.75
"	11.	"	3165 E. G. Eberle.		
			Journal (b).....	52.00	
			Journal (c).....	19.00	
			Journal (d).....	15.88	
			Salaries.....	312.50	399.38
"	"	"	3166 Eschenbach Printing Co.		
			Journal (a).....		451.58
"	"	"	3167 J. B. Lippincott & Co.		
			National Formulary.....		102.00
"	"	"	3168 Buxton & Skinner.		
			Printing, postage and stationery		1.30
"	21.	"	3169 Louis C. Hesse.		
			Printing, postage and stationery		3.75
"	"	"	3170 W. T. Robinson.		
			Printing, postage and stationery		16.50
April	1.	"	3171 O. A. Beath.		

			Committee on Membership.....		2.40
"	8.	"	3172 Universal Loose Leaf Co.		
			Printing, postage and stationery		2.50
"	"	"	3173 Wm. B. Day.		
			Clerical.....	32.00	
			Year Book.....	1.44	
			Miscellaneous.....	1.50	34.04
"	"	"	3174 E. G. Eberle.		
			Salaries.....	312.50	
			Journal (a).....	26.58	
			Journal (b).....	52.00	
			Journal (c).....	13.50	
			Journal (d).....	.50	405.08
"	"	"	3175 Eschenbach Printing Co.		
			Committee on Membership.....	3.20	
			Journal (a).....	521.63	524.83
"	9.	"	3176 Eschenbach Printing Co.		
			Printing, postage and stationery		2.00
"	"	"	3177 John C. Wallace.		
			National Drug Conference.....		61.00
"	17.	"	3178 H. M. Whelpley.		
			Printing, postage and stationery	44.81	
			Miscellaneous.....	10.50	55.31
"	"	"	3179 Keenan-Murphy Typewriter Ex.		1.50
			Miscellaneous.....		1.50
May	2.	"	3180 Hill-Top Printing Co.		
			Section on Commercial Interest..		6.75
"	7.	"	3181 W. T. Robinson.		
			Printing, postage and stationery		5.00
"	"	"	3182 Wm. B. Day.		
			Printing, postage and stationery	10.00	
			Clerical.....	40.00	
			Year Book.....	1.96	51.96
"	"	"	3183 American A. Ph. A. Research Fund.		
			National Formulary IV Special..		1,976.49
"	12.	"	3184 E. G. Eberle.		
			Salaries.....	312.50	
			Journal (a).....	27.58	
			Journal (b).....	52.00	
			Journal (c).....	26.00	
			Journal (d).....	20.04	438.12
"	"	"	3185 Eschenbach Printing Co.		
			Journal (a).....		482.53
"	"	"	3186 Louis C. Hesse.		
			Printing, postage and stationery		4.75
"	30.	"	3187 J. W. England.		
			Printing, postage and stationery		33.42
June	6.	"	3188 Wm. B. Day.		
			Printing, postage and stationery	20.00	

			Clerical.....	32.00	
			Miscellaneous.....	.60	52.60
"	"	"	3189 Eschenbach Printing Co.		
			Printing, postage and stationery	1.40	
			Women's Section.....	11.20	
			Journal (a).....	20.00	32.60
"	17.	"	3190 E. G. Eberle.		
			Salaries.....	312.50	
			Journal (b).....	65.00	
			Journal (a).....	8.50	
			Journal (d).....	21.12	407.12
"	"	"	3191 E. F. Greathead.		
			Printing, postage and stationery		4.25
"	"	"	3192 Eschenbach Printing Co.		
			Printing, postage and stationery	6.60	
			Journal (a).....	26.30	
			Journal (a).....	481.24	514.14
"	"	"	3193 J. B. Lippincott & Co.		
			National Formulary IV.....		102.50
"	24.	"	3194 A. G. DuMez.		
			Section Scientific Papers.....		16.00
"	"	"	3195 Check not drawn for this number		
July	3.	"	3196 J. W. England.		
			Salaries.....		150.00
"	"	"	3197 Wm. B. Day.		
			Salaries.....		375.00
"	"	"	3198 H. V. Arny.		
			Salaries.....		300.00
"	9.	"	3199 E. F. Greathead.		
			Printing, postage and stationery		8.90
"	"	"	3200 H. M. Whelpley.		
			Salaries.....	500.00	
			Printing, postage and stationery	1.00	
			Miscellaneous.....	8.90	509.90
"	"	"	3201 Wm. B. Day.		
			Clerical.....	32.00	
			Miscellaneous.....	.15	
			Year Book (Miscellaneous).....	3.67	35.82
"	"	"	3202 Louis C. Hesse.		
			Printing, postage and stationery		3.50
"	"	"	3203 E. G. Eberle.		
			Salaries.....	312.50	
			Journal (b).....	52.00	
			Journal (c).....	16.02	
			Journal (d).....	21.13	
			Historical Section.....	2.00	403.65
"	"	"	3204 Eschenbach Printing Co.		
			Journal (a).....	437.84	
"	22.	"	3205 J. B. Lippincott & Co.		
			National Formulary IV.....		25.25

	25.	"	3206	E. F. Greathead. Printing, postage and stationery		13.25
Aug.	4.	"	3207	Louis C. Hesse. Printing, postage and stationery		29.50
"	"	"	3208	E. F. Greathead. Printing, postage and stationery		13.25
"	9.	"	3209	Wm. B. Day. Clerical.....	40.00	
				Miscellaneous.....	2.11	42.11
"	18.	"	3210	W. T. Robinson. Membership Committee.....		16.50
"	"	"	3211	Spahr & Glenn. Women's Section.....		13.25
"	"	"	3212	E. G. Eberle. Salaries.....	312.50	
				Journal (a).....	29.45	
				Journal (b).....	53.15	
				Journal (c).....	15.85	
				Journal (d).....	26.37	437.32
"	"	"	3213	Eschenbach Printing Co. Journal (a).....		386.97
"	"	"	3214	Philadelphia Branch A. PH. A. Membership Committee.....		20.00
"	22.	"	3215	R. W. Terry. Section on Practical Pharmacy and Dispensing.....		23.04
"	"	"	3216	Eschenbach Printing Co. Journal (a).....		33.18
"	"	"	3217	Louis C. Hesse. Printing, postage and stationery		12.00
"	"	"	3218	Wm. J. Kennedy Stationery Co. Printing, postage and stationery		2.50
"	"	"	3219	H. M. Whelpley. Motion 4, Council Letter No. 3 . .	250.00	
				Printing, postage and stationery	.87	
				Miscellaneous.....	3.75	254.62
"	"	"	3220	Eschenbach Printing Co. Journal (a).....		31.40
"	30.	"	3221	Eschenbach Printing Co. Year Book VI.....		3,575.98
Sept.	5.	"	3222	Wm. B. Day. Printing, postage and stationery	5.00	
				Clerical.....	32.00	
				Miscellaneous.....	3.14	40.14
"	"	"	3223	S. L. Hilton. Drug Trade Conference.....		10.07
"	11.	"	3224	J. W. England. Printing, postage and stationery		31.31
"	"	"	3225	Ivor Griffith. Printing, postage and stationery		16.70

			3226	E. F. Greathead.		
				Printing, postage and stationery		17.75
			3227	A. H. Fetting Mfg. Jewelry Co.		
				Badges and Bars.....		39.38
			3228	J. B. Lippincott & Co.		
				National Formulary IV.....		480.00
	20.		3229	E. F. Greathead.		
				Printing, postage and stationery		13.25
			3230	J. W. England.		
				Traveling Expenses.....		48.33
			3231	Wm. B. Day.		
				Traveling Expenses.....		110.00
			3232	W. T. Robinson.		
				Membership Committee.....		40.00
	20,		3233	H. V. Army.		
				Year Book.....		39.33
			3234	W. F. Rudd.		
				Committee on Education and Legislation.....		15.25
			3235	E. Fullerton Cook.		
				Commercial Section.....		23.95
			3236	Louis C. Hesse.		
				National Formulary IV.....		9.00
			3237	Wilbur L. Scoville.		
				National Formulary IV.....		3.53
			3238	American Metric Association.		
				Miscellaneous.....		10.00
			3239	E. G. Eberle.		
				Salaries.....	312.50	
				Journal (b).....	65.00	
				Journal (c).....	16.39	
				Journal (d).....	6.12	400.01
			3240	Eschenbach Printing Co.		
				Journal (a).....		493.55
Oct.	1.		3241	E. F. Greathead.		
				Printing, postage and stationery		13.25
			3242	W. T. Robinson.		
				Printing, postage and stationery		4.00
			3243	Hugo Kantrowitz.		
				Historical Section.....		6.75
			3244	General Shorthand Reporting Co.		
				Stenographers.....		343.21
	3.		3245	J. B. Lippincott & Co.		
				National Formulary IV.....		587.00
			3246	Chicago Branch A. P. H. A.		
				Committee on Membership.....		44.00
	10.		3247	E. G. Eberle.		
				Salaries.....	312.50	
				Journal (b).....	39.00	
				Journal (c).....	11.50	

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			Journal (d).....	41.28	404.28
"	"	"	3248 Eschenbach Printing Co.		
			Journal (a).....		488.75
"	"	"	H. M. Whelpley		
			Traveling Expenses.....	124.38	
"	"	"	Miscellaneous.....	.35	124.73
"	"	"	3250 National Committee on the Pharmaceutical Syllabus.		
			National Syllabus Committee ...		25.00
"	"	"	3251 Louis C. Hesse.		
			National Formulary IV.....		9.18
"	"	"	3252 Burgmeier Book Binding.		
			Miscellaneous.....		9.00
"	15.	"	3253 W. T. Robinson.		
			Printing, postage and stationery		8.50
"	"	"	3254 Wm. B. Day.		
			Printing postage and stationery	10.00	
			Clerical.....	32.00	
			Miscellaneous.....	11.34	53.34
"	"	"	3255 J. B. Lippincott & Co.		
			National Formulary.....		720.00
"	"	"	3256 Low's Letter Service.		
			Printing, postage and stationery		4.40
"	"	"	3257 Fidelity & Deposit Co. of Mary- land.		
			Premium on Treasurer's Bond ..		62.50
"	"	"	3258 Louis C. Hesse.		
			Printing, postage and stationery		19.00
"	"	"	3259 Department of Journalism Press.		
			Printing, postage and stationery		7.09
"	"	"	3260 J. B. Lippincott & Co.		
			National Formulary IV.....		298.88
"	"	"	3261 H. H. Schaefer.		
			Membership Committee.....		58.00
Nov.	3.	"	3262 George Denton Beal.		
			Special A. PH. A. Research Fund		240.00
"	5.	"	3263 Boston Penny Savings Bank.		
			Special—Transfer A. PH. A. Acct. from International Bk. of St. L.		15,000.00
"	12.	"	3264 Eschenbach Printing Co.		
			Journal (a).....	605.72	
			Journal (a).....	21.00	626.72
"	"	"	3265 E. G. Eberle.		
			Salaries.....	312.50	
			Journal (a).....	20.12	
			Journal (b).....	65.00	
			Journal (c).....	8.00	
			Journal (d).....	49.45	455.07
"	"	"	3266 Wm. B. Day.		
			Printing, postage and stationery	24.00	

			Clerical.....	40.00	
			Miscellaneous.....	2.20	66.20
"	19.	"	3267 American Trust Co.		
			Miscellaneous.....		5.00
"	"	"	3268 Northwestern Branch A. PH. A.		
			Membership Committee.....		99.00
"	"	"	3269 W. D. Walters.		
			Special W. W. V. Sec.....	100.64	
			Special W. W. V. Sec.....	41.80	142.44
"	"	"	3270 Ohio Office Supply Co.		
			Special W. W. V. Sec.....		90.60
"	"	"	3271 Rose M. Engle.		
			Special W. W. V. Sec.....		11.54
"	21.	"	3272 W. T. Robinson.		
			Printing, postage and stationery		9.75
"	"	"	3273 H. P. Helsey.		
			Amer. Joint Com. on Horti- cultural Nomenclature.....		25.00
"	"	"	3274 H. V. Army.		
			Printing, postage and stationery		68.95
"	"	"	3275 St. Louis Branch A. PH. A.		
			Membership.....		10.00
Dec.	1.	"	3276 Louis C. Hesse.		
			Printing, postage and stationery		11.25
"	"	"	3277 H. M. Whelpley.		
			Printing, postage and stationery		123.73
"	6.	"	3278 W. T. Robinson.		
			Printing, postage and stationery		28.50
"	"	"	3279 R. P. Finchelis.		
			Special W. W. V. Sec.....		104.73
"	8.	"	3280 John C. Wallace.		
			Nat'l. Drug Trade Conference ..		48.74
"	"	"	3281 Jeannot Hostmann.		
			Printing, postage and stationery		19.77
"	"	"	3282 Wm. B. Day.		
			Printing, postage and stationery	86.00	
			Clerical.....	32.00	118.00
"	11.	"	3283 E. T. Greathead.		
			Printing, postage and stationery		13.25
"	"	"	3284 Eschenbach Printing Co.		
			Journal (b).....		574.73
"	"	"	3285 E. G. Eberle.		
			Salaries.....	312.50	
			Journal (a).....	3.20	
			Journal (b).....	61.75	
			Journal (c).....	32.65	
			Journal (d).....	3.82	
			Miscellaneous.....	14.80	428.72
"	18.	"	3286 Chicago Addressing Co.		
			Printing, postage and stationery		40.99

"	"	"	3287	W. T. Robinson.		
				Printing, postage and stationery		23.75
"	"	"	3288	W. D. Walters.		
				Special, W. War Vet. Section . . .		100.00
"	20.	"	3289	J. B. Lippincott & Co.		
				National Formulary IV.....		126.25
"	24.	"	3290	H. V. Army.		
				Salaries.....		300.00
"	"	"	3291	Wm. B. Day.		
				Salaries.....		375.00
"	"	"	3292	E. T. Greathead.		
				Printing, postage and stationery		14.40
"	26.	"	3293	W. T. Robinson.		
				Printing, postage and stationery		4.50
"	"	"	3294	J. W. England.		
				Salaries.....	150.00	
				Printing, postage and stationery	50.67	200.67
"	31	"	3295	H. M. Whelpley.		
				Salaries.....	500.00	
				Printing, postage and stationery	2.00	
				Miscellaneous.....	1.15	503.15
"	"	"	3296	W. T. Robinson.		
				Printing, postage and stationery		3.50
Total amount disbursed by check.....						\$40,931.24
Transfer to Funds.....						20,095.23
Grand Total of Disbursements.....						\$61,026.47

SUMMARY OF DISBURSEMENTS.

JANUARY 1, 1919 TO JANUARY 1, 1920.

DISBURSED BY CHECK.

Transfer of Funds from International Bank of St. Louis to Boston Penny Savings Bank.....				\$15,000.00
Salaries.....			6,400.00	
Printing, postage and stationery.....			988.69	
Clerical	{	Secretary..... \$ 424.00	674.00	
	{	Treasurer..... 250.00		
Miscellaneous expenses.....			409.82	
Stenographers.....			343.21	
Traveling expenses.....			277.71	
Committee on Membership.....			299.60	
Year Book VI.....			3,624.29	
Gold Badges and bars.....			39.38	
Certificates.....			5.00	
Premium on Treasurer's bond.....			62.50	
National Drug Trade Conference.....			119.81	
National Syllabus Committee.....			25.00	

Section on Scientific Papers.....	16.00	
Section on Education and Legislation.....	15.25	
Practical Pharmacy and Dispensing.....	23.04	
Commercial Section.....	30.70	
Historical Section.....	8.75	
Women's Section.....	24.45	
Journal (a) Publication.....	\$ 5,664.55	7,256.65
Journal (b) Clerical.....	1,184.93	
Journal (c) Printing, postage and stationery.....	201.46	
Journal (d) Freight, drayage and miscellaneous.....	205.71	
American Joint Conference on Horticulture Nomenclature.....	25.00	
World War Veteran Section.....	449.31	
		<hr/>
Total Association Expenses.....		\$21,118.16
From Research Fund for Research Work.....		240.00
National Formulary IV.....		2,596.59
To A. Ph. A. Research Fund from National Formulary, IV.....		1,976.49
		<hr/>
Total disbursed by check.....		\$40,931.24

DISBURSED TO FUNDS.

Life Membership Fund.....	\$ 2,670.74	
Ebert Prize Fund.....	1,203.14	
Centennial Fund.....	2,550.87	
Endowment Fund.....	1,388.60	
Ebert Legacy Fund.....	894.13	
A. Ph. A. Research Fund.....	9,222.68	
Procter Monument Fund.....	2,018.00	
College Prize Fund.....	1.76	
Rice Memorial Fund.....	102.63	
Remington Honor Medal Fund.....	42.68	
		<hr/>
Total Transfer of Funds.....		\$20,095.23
		<hr/>
Total amount of disbursements.....		\$61,026.47

APPROPRIATIONS AND DISBURSEMENTS.

	Appropriation	Disbursement
Salaries.....	\$ 6,400.00	\$ 6,400.00
Printing, postage and stationery.....	1,000.00	988.69
Clerical Expense—Secretary.....	416.00	424.00
Clerical Expense—Treasurer.....	250.00	250.00
Miscellaneous Expense.....	500.00	409.82
Stenographers.....	350.00	343.21
Traveling Expense.....	278.06	277.71
Committee on Membership.....	250.00	299.60

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Committee on Unofficial Standards.....	100.00
Year Book.....	3,624.29	3,624.29
Premium on Treasurer's Bond.....	62.50	62.50
National Drug Trade Conference.....	200.00	119.81
Section on Scientific Papers.....	25.00	16.00
Section on Education and Legislation.....	25.00	15.25
Section on Commercial Interests.....	25.00	30.70
Section on Practical Pharmacy and Dispensary.....	25.00	23.04
Section on Historical Pharmacy.....	25.00	8.75
Women's Section.....	50.00	24.45
National Syllabus Committee.....	25.00	25.00
Receipe Book.....	50.00	.....
Journal.....	7,256.65	7,256.65
American Joint Conference on Horticulture Nomenclature	25.00	25.00
World War Veteran Section.....	500.00	449.31
National Formulary.....	2,596.59	2,596.59
Badges and Bars.....	50.00	39.38
Certificates.....	50.00	5.00
Transfer of Current Account.....	15,000.00	15,000.00
Total.....	\$39,159.09	\$38,714.75

TOTAL DISBURSEMENTS FROM JANUARY 1, 1919 TO JANUARY 1, 1920.

Disbursed by Appropriation.....	\$38,714.75
Disbursed without Appropriation to Research Fund on account of N. F. IV (see Rule of Finance XIV).....	1,976.49
For Research Work (from the Research Fund).....	240.00
Total amount disbursed by check from January 1, 1919 to January 1, 1920.....	\$40,931.34
Transfer to Funds.....	20,095.23
Total Disbursement January 1, 1919 to January 1, 1920	\$61,026.47

THE A. PH. A. PERMANENT FUNDS—JANUARY 1, 1920.

	January 1, 1920	1919	Increase
Life Membership Fund.....	\$24,845.08	\$23,777.44	\$1,067.64
Ebert Prize Fund.....	1,289.21	1,181.94	107.27
Centennial Fund.....	3,423.51	3,176.67	246.84
Endowment Fund.....	8,040.04	7,428.12	611.92
Ebert Legacy Fund.....	4,725.69	4,504.64	221.05
A. Ph. A. Research Fund.....	14,127.30	11,398.33	2,728.97
Total—January 1, 1920.....	\$56,450.83	\$51,467.14	\$4,983.69

FUNDS HELD IN TRUST BY A. PH. A.

	January 1, 1920	1919	Increase
Procter Monument Fund.....	\$9,722.89	\$9,243.20	\$479.69
College Prize Fund—Transferred to Endow- ment Fund.....		41.71	.....

Rice Memorial Fund—Transferred to Endowment Fund.....		183.65
Jos. P. Remington Honor Medal Fund.....	1,042.68	1,000.00	42.68
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Total—January 1, 1920.....	\$10,765.57	\$10,468.56	297.01
Soldier and Sailor Fund (this is a Committee Fund).....	455.71		\$455.71

TOTAL FUNDS

	January 1, 1920	1919	Increase
Permanent.....	\$56,450.83	\$51,467.14	\$4,983.69
National Formulary (after over-head expenses)	2,226.77	1,976.49	250.28
Trust.....	10,765.57	10,468.56	297.01
Current.....	29,567.08	27,740.42	1,826.66
<hr/>			
Total—January 1, 1920.....	\$99,010.25	\$91,652.61	\$8,107.36

THE ASSOCIATION ASSETS, JANUARY 1, 1920

St. Louis City Bonds.....	\$10,000.00	
Cash in Boston Penny Savings Bank.....	15,000.00	
Cash in International Bank of St. Louis Exclusive of N. F. IV to be transferred to A. PH. A. Research Fund.....	4,567.08	
<hr/>		
Available Assets.....		\$29,567.08
National Formulary IV (to be transferred to A. PH. A. Research Fund).....		2,226.77
Permanent Funds.....		56,450.83
Funds held in trust.....		10,765.57
<hr/>		
Total A. PH. A. Assets, January 1, 1920.....		\$99,010.25

LIFE MEMBERSHIP FUND (ESTABLISHED 1870)

On hand January 1, 1919. Mass. State Reg. Bonds, 3%.....		\$13,000.00
Fourth-4 1/4% U. S. Liberty Bonds.....		10,000.00
Cash in Boston Penny Savings Bank—January 1, 1919.....	\$534.56	
Interest on Massachusetts State Registered Bonds.....	195.00	
Interest on deposit in Boston Penny Savings Bank.....	12.20	
<hr/>		
Total amount deposited—Boston Penny Savings Bank.....		\$741.76
Withdrawn from Boston Penny Savings Bank and deposited in International Bank of St. Louis to invest in Liberty Bonds.....		741.76
<hr/>		
Balance on hand in Boston Penny Savings Bank		.00

On hand, January 1, 1919—International Bank of St. Louis.....	\$242.88	
Interest on U. S. Liberty Bonds.....	440.01	
Received from Boston Penny Savings Bank....	741.76	
Life Membership Fee (Chas. Schaffer).....	100.00	
Interest on Massachusetts State Registered Bonds.....	195.00	
Interest on deposit—International Bank of St. Louis.....	6.10	
Total in International Bank of St. Louis.....	\$1,725.75	
Invested in 4th 4½% U. S. Liberty Bonds....	1,680.67	
Balance in International Bank of St. Louis.....		\$45.08
Fourth 4-¼% U. S. Liberty Bonds (face value).....		1,800.00
Total on hand—December 31, 1919.....		\$24,845.08

ALBERT E. EBERT PRIZE FUND (ESTABLISHED 1873)

On hand, January 1, 1919—Boston Penny Savings Bank.....	\$1,181.94	
Interest on deposit—Boston Penny Savings Bank.....	2.42	
Total deposit—Boston Penny Savings Bank...	\$1,184.36	
Withdrawn from Boston Penny Savings Bank and deposited in International Bank of St. Louis to invest in U. S. Liberty Bonds.....	1,150.00	
Balance in Boston Penny Savings Bank.....		\$34.36
Deposited in International Bank of St. Louis to invest in U. S. Liberty Bonds.....	\$1,150.00	
Interest on U. S. Liberty Bonds.....	47.73	
Interest on deposit—International Bank of St. Louis.....	.24	
Commission refunded on Bond purchased	2.75	
Total deposit—International Bank of St. Louis	\$1,200.72	
Invested in 4th 4-1/4% U. S. Liberty Bonds .	1,145.87	
Balance in International Bank of St. Louis.....		\$54.85
Fourth 4-1/4% U. S. Liberty Bonds (face value).....		1,200.00
Total on hand—December 31, 1919.....		\$1,289.21

CENTENNIAL FUND (ESTABLISHED 1877)

On hand, January 1, 1919. Massachusetts State Registered Bonds, 3%.....	\$1,000.00
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Cash on hand—Boston Penny Savings Bank...	\$2,176.67	
Interest on Massachusetts State Bonds.....	15.00	
Interest on deposit—Boston Penny Savings Bank.....	5.02	
	<hr/>	
Total deposit—Boston Penny Savings Bank...	\$2,196.69	
Withdrawn from Boston Penny Savings Bank and deposited in International Bank of St. Louis.....	2,196.69	
	<hr/>	
Balance on hand in Boston Penny Savings Bank		.00
Received from Boston Penny Savings Bank and deposited in International Bank of St. Louis, February 17, 1919.....	\$2,000.00	
Received from Boston Penny Savings bank, May 6, 1919.....	150.00	
Received from Boston Penny Savings Bank, November 28, 1919.....	46.69	
Interest on Liberty Bonds.....	91.31	
Interest on Massachusetts State Bonds.....	15.00	
Interest on deposit—International Bank of St. Louis.....	.58	
	<hr/>	
Total deposit—International Bank of St. Louis	\$2,303.58	
Invested in 4th 4- $\frac{1}{4}$ % U. S. Liberty Bonds ..	2,280.07	
	<hr/>	
Balance on hand in International Bank of St. Louis.....		\$23.51
Fourth 4- $\frac{1}{4}$ % U. S. Liberty Bonds (face value).....		2,400.00
		<hr/>
Total on hand—December 31, 1919.....		\$3,423.51

ENDOWMENT FUND (ESTABLISHED 1906)

On hand, January 1, 1919, viz:		
Fourth U. S. Liberty Bonds @ 4- $\frac{1}{4}$ %.....		\$7,000.00
On hand in Boston Penny Savings Bank.....	\$359.12	
Interest on deposit—Boston Penny Savings Bank.....	7.76	
	<hr/>	
Total in Boston Penny Savings Bank.....	\$366.88	
Withdrawn from Boston Penny Savings Bank and deposited in International Bank of St. Louis.....	360.00	
	<hr/>	
Balance in Boston Penny Savings Bank, December 31, 1919.....		\$6.88
On hand—International Bank of St. Louis.....	\$69.00	
Interest on U. S. Liberty Bonds.....	302.92	

Deposited in International Bank of St. Louis		
from Boston Penny Savings Bank.....	360.00	
Transferred from Rice Memorial Fund.....	94.68	
Transferred from College Prize Fund.....	43.47	
Interest on deposit—International Bank of St. Louis.....	1.43	
	<hr/>	
Total in International Bank of St. Louis.....	\$871.50	
Invested in 4th 4- $\frac{1}{4}$ % U. S. Liberty Bonds .	838.34	
	<hr/>	
Balance in International Bank of St. Louis.....		\$33.16
Fourth 4- $\frac{1}{4}$ % U. S. Liberty Bonds (face value).....		900.00
Transferred from Rice Memorial Fund—4th 4- $\frac{1}{4}$ % U. S. Liberty Bond.....		100.00
		<hr/>
Total on hand, December 31, 1919.....		\$8,040.04

ALBERT E. EBERT LEGACY FUND (ESTABLISHED 1909)

On hand January 1, 1919. St. Louis Pub. Building and Imp. Gold Bonds.....		\$2,000.00
Second Conv. 4% U. S. Liberty Bonds (Reg.)..		2,000.00
Cash in International Bank of St. Louis—January 1, 1919.....	\$504.64	
Interest on St. Louis City Bonds.....	80.00	
Interest on U. S. Liberty Bonds.....	102.86	
Interest on Deposits—International Bank of St. Louis.....	4.73	
	<hr/>	
Total amount in International Bank of St. Louis	\$692.23	
Invested in 4th 4- $\frac{1}{4}$ % U. S. Liberty Bonds . .	666.54	
	<hr/>	

Balance in International Bank of St. Louis—December 31, 1919.....	25.69
Fourth 4- $\frac{1}{4}$ % U. S. Liberty Bonds (face value).....	700.00
	<hr/>
Total on hand—December 31, 1919.....	\$4,725.69

A. PH. A. RESEARCH FUND (ESTABLISHED 1917)

On hand January 1, 1919. Second Conv. 4- $\frac{1}{4}$ % Liberty Bonds.....		\$5,000.00
Cash on hand International Bank of St. Louis—January 1, 1919.....	\$6,398.33	
Balance from overhead exp. of N. F. IV.....	1,976.49	
Interest on deposit—International Bank of St. Louis.....	30.21	
Interest on U. S. Liberty Bonds.....	512.47	
	<hr/>	
Total Deposit—International Bank of St. Louis	\$8,917.50	
Invested in 4- $\frac{1}{4}$ % U. S. Liberty Bonds.....	\$8,650.20	

Geo. Denton Beal for Research Work.....	240.00
Total Disbursement.....	8,890.20
Balance in International Bank of St. Louis— December 31, 1919.....	\$27.30
Fourth 4-1/4% U. S. Liberty Bonds (face value).....	9,100.00
Total on hand—December 31, 1919.....	\$14,127.30

RICE MEMORIAL FUND (ESTABLISHED 1913)

On hand—International Bank of St. Louis—January 1, 1919.....	\$183.65
Interest on U. S. Liberty Bonds @ 4-1/4%.....	4.15
Interest on deposit—International Bank of St. Louis.....	2.68
Total in International Bank of St. Louis.....	\$190.48
Invested in U. S. Liberty Bonds @ 4-1/4%.....	95.80
Cash on hand—International Bank of St. Louis, December 31, 1919.....	\$94.68
4th 4-1/4% U. S. Liberty Bond (face value).....	100.00
Total.....	\$194.68
Transferred to Endowment Fund— November 13, 1919.....	194.68
(See Journal A. PH. A., October, 1919, Page 861)	
Balance on hand—December 31, 1919.....	.00

COLLEGE PRIZE FUND (ESTABLISHED 1873)

On hand—Boston Penny Savings Bank, Janu- ary 1, 1919.....	\$41.71
Interest on deposit—Boston Penny Savings Bank.....	1.76
Total.....	\$43.47
Transferred to Endowment Fund—October 22, 1919.....	43.47
(See Journal A. PH. A., October, 1919, Page 861)	
Balance on hand—December 31, 1919.....	.00

WM. PROCTER, JR., MONUMENT FUND (Established 1904)

On hand, January 1, 1919, U. S. Liberty Bonds, 2nd Conv. 4 $\frac{1}{4}$ %	\$ 8,000.00
Cash in International Bank of St. Louis, January 1, 1919.....	\$ 1,243.20
Interest on U. S. Liberty Bonds.....	390.66
Interest on deposit—International Bank of St. Louis.....	8.05
Total in International Bank of St. Louis ...	\$ 1,641.91
Investment in U. S. Liberty Bonds—4 $\frac{1}{4}$ % ..	1,619.02
Balance in International Bank of St. Louis .	\$ 22.89
4th 4 $\frac{1}{4}$ % U. S. Liberty Bond (face value) .	1,700.00
Total on hand—December 31, 1919.....	\$ 9,722.89

JOS. P. REMINGTON HONOR MEDAL FUND (Established 1918)

On hand, January 1, 1919, U. S. Liberty Bond.....	\$ 1,000.00
Interest on U. S. Liberty Bond—4 $\frac{1}{4}$ %	\$ 42.50
Interest on deposit—International Bank of St. Louis.....	.18
Total in International Bank of St. Louis ...	42.68
Total on hand—December 31, 1919.....	\$ 1042.68

SOLDIER AND SAILOR FUND (Established 1918)

Contributions received.....	\$ 2,075.15
Interest from December 5, 1918 to Jan. 1, 1920.....	20.76
Total received.....	\$ 2,095.91
Disbursed by check.....	\$ 1,628.90
Bank Exchange.....	11.80
Total disbursement.....	\$ 1,640.20
Balance on hand—International Bank of St. Louis, January 1, 1920.....	\$ 455.71

More detailed information about the funds is given in the report of the Treasurer, published in the JOURNAL OF THE A. PH. A., for December, 1919.

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REPORT ON THE PROGRESS OF PHARMACY 1919

By HENRY V. ARNY

WITH THE COLLABORATION OF

ANNA G. BAGLEY
CHARLES W. BALLARD
LINWOOD A. BROWN
KARL S. BURKETT
ZADA M. COOPER
MAY O'C. DAVIS
WILLIAM B. DAY
GEORGE C. DIEKMAN
HERMANN ENGELHARDT
ROBERT P. FISCHELIS
EDMUND N. GATHERCOAL

IVOR GRIFFITH
FANCHON HART
JEANNOT HOSTMANN
HENRY KRAEMER
JOSEPH L. MAYER
WILLIAM A. PUCKNER
HUGO H. SCHAEFER
CLYDE M. SNOW
JOHN K. THUM
ARNO VIEHOVER
CURT P. WIMMER

HEBER W. YOUNGKEN

INTRODUCTORY

This 1919 report was not completed as early as the Reporter had expected or desired, as some of his time had to be used in preparing the Bibliography of Pharmaceutical Research for 1920, which is now appearing in each issue of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION. The time thus spent, however, can scarcely be called a delay in the preparation of the YEAR BOOK, as the bibliographical matter thus compiled should materially speed the work of preparing the 1920 report.

The co-operation with "Botanical Abstracts," begun in 1918 with Professor Henry Kraemer, has been continued through the courtesy of his editorial successor, Professor Heber W. Youngken; such material as has been used being credited to "Botanical Abstracts."

NEW YORK, AUG. 17, 1920.

PHARMACY

A—GENERAL SUBJECTS

PHARMACOPŒIAS AND FORMULARIES.

United States Pharmacopœia.—*Revision Problems.*—At the New York meeting of the American Pharmaceutical Association, L. F. Kebler presented a report, the purpose of which was to call attention to a number of problems that the Committee on Revision of the next Pharmacopœia will have to consider. Among these are providing for a reduction in the alcohol content of galenicals, the elimination of the one-man method of preparing pharmacopœial tests, the increase of biologic assay methods and the providing for one year between the appearance of the book and the date when it will become effective.—*Pharm. Era*, 52 (1919), 287.

United States Pharmacopœia.—*Constructive Suggestions for the Revision of.*—F. B. Kilmer discusses in detail the Tenth Revision from the standpoint of scope; standards; the physician; popularity; criticisms, language; spirit of revision and fundamental principles.—*Proc. N. J. Pharm. Assoc.*, 49 (1919), 68. (J. H.)

United States Pharmacopœia.—*Research in Its Revision.*—A. H. Clark thinks that every individual who seeks to verify the correctness of pharmacopœial statements either in literature or by experiment soon discovers how stupendous the task would be. The policy of changing only those things that have been criticized or about which there is new literature, has resulted in handing down statements that need verification and also the inclusion of unimportant statements. The need for more research is obvious. Mr. Clark enumerates the agencies that seem available, discusses the means of conducting research, emphasizing the fact that not only should the best talent be enlisted but at salaries which will adequately compensate for their full time. The United States Pharmacopœial Convention and the Government of the United States seem the only possible authorities for conducting the Revision and suggestions are made as to procedure, if either were to do it or if they were to work together.—*J. Am. Pharm. Assoc.*, 8 (1919), 13. (Z. M. C.)

United States Pharmacopœia and the Formulary.—*Revision Recommendations.*—Geo. M. Beringer read a report of the Committee on Pharmacopœias and Formularies from which the following recommendations are taken: Admission of an article or preparation should be based upon general medical use. Dismissal should be based only upon determination of insufficiency of general medical use. The "purity rubric" should be made as elastic as consistent with the maintenance of proper standards. Other recommendations were the omission of geographical designations, the convening of another International Conference for the Unification of Potent Remedies, the exclusive use of the Metric System, the adoption of 20° as the standard temperature except in some special cases (refractive indices), the adoption of more "type formulas," the adoption of standards for homeopathic drugs.—Proc. N. J. Pharm. Assoc., 49 (1919), 65. (J. H.)

United States Pharmacopœia and the Formulary.—*Revision Suggestions.*—P. E. Hommell presents a lengthy paper discussing and criticizing a few pharmacopœial chemicals and botanicals and practically all galenicals of the U. S. P. and N. F.—Proc. N. J. Pharm. Assoc., 49 (1919), 39. (J. H.)

N. F. IV.—*Criticisms and Comments on.*—Jacob Diner reminds us that we were not bound to comply with the formulas in this book nor were we punishable by law if we deviated from them until the passage of the National Pure Food and Drugs Act made it an official book of standards; propaganda for legitimate and rational prescribing has had a part also in making it more than merely a reference book.

We need to apply principles of conservation in drug supplies as we have with money and food and clothing. Drugs that are not essential in the treatment of disease should be eliminated or used less lavishly. Among the non-essentials are such preparations as Aceticum Aromaticum and Aqua Phenolata. Unscientific preparations are of two classes, physiologically incompatible and formulas that are irrational. The different elixirs of bromides are typical of the former class. "If we are going to employ bromides for the purpose of allaying hyperexcitability, a condition most decidedly akin to, if not entirely due to loss of control by higher centers, why combine it with a drug (alcohol) which principally acts as a depressant to the higher centers, and has indirectly, if not di-

rectly, a stimulant effect upon our reflexes." Palatability can be obtained without the elixir. The various liquid preparations of bismuth salts are examples of irrational formulas. If bismuth is given for its protective astringent action, why put it into solution and risk cardiac depression by absorption or have it precipitated by the hydrochloric acid of the stomach. Palatability cannot be even an excuse here. Alcoholic diuretics are open to similar criticism. Why use Elixir of Buchu when alcohol is irritant to renal epithelium? Again, is there justification for so many elixirs of cinchona and its alkaloids or for such varying doses of strychnine in the elixirs containing it? Uniformity in dosage would make prescribing by physicians easier.

The National Formulary should be simplified, standardized and made scientifically unassailable.—J. Am. Pharm. Assoc., 8 (1919), 94. (Z. M. C.)

National Formulary.—*Botanical Nomenclature of.*—This paper is supplemental to a previous one by the same author, O. A. Farwell. (See YEAR BOOK, 1917, 7.) Several of the botanical titles appearing in the National Formulary are criticized for reasons of non-compliance with the rules of priority adopted in botanical nomenclature. Criticism of the titles applied to the sources of the non-official tonga bark and sandarac forms part of the article.—Drug. Circ., 63 (1919), 49. (C. W. B.)

National Formulary.—*Some Suggestions for Revision of.*—W. L. Scoville believes that the lack of comments on N. F. IV is not because of its perfection but rather due to conditions incident to the war. He calls attention to a number of preparations which precipitate badly and suggests changes that may prevent precipitation. The addition of tragacanth to emulsions to prevent separation into layers might be advisable. A list of preparations is given also which should have definite standards and assay methods if they are to be retained. Pepsin preparations should receive considerable attention for fewer would answer every need and those retained should be uniform in chemical and physiological composition. The present recipe for tincture of vanilla should be simplified.—J. Am. Pharm. Assoc., 8 (1919), 745. (Z. M. C.)

Pharmacopœial Nomenclature.—*Dangerous.*—Prior to the outbreak of the war the necessity of establishing international stand-

ards for potent drugs was realized, and in the course of time recognized by all pharmacopœias. But while provisions were made for standardizing the strength of certain preparations, nothing was done toward establishing uniformity in nomenclature, either in the Latin titles adopted by different pharmacopœias, or indeed in the names of similar preparations. Thus, at present we have the following official varieties in Latin nomenclature for the same substance: Hydrargyri subchloridum, hydrargyri chloridum mite, hydrargyrum monochloratum, chloretum hydrargyrosus, hydrargyrum chloratum. This lack of uniformity in nomenclature almost led to a Belgian pharmacist being shot. He dispensed on the order of a German army doctor, calling for "Hydrargyrum chloratum, 50 Ag [50 Cg.?—EDITOR] 10 Stück" tablets of corrosive sublimate and despite the proper labelling of the container as "Poison," "for external use" and "Hydrargyrum chloratum—Sublimé corrosive," a German hospital attendant administered one to a patient with fatal results. It required much effort to release the pharmacist from the charge of attempting to cause the death of a German citizen.—Chem. and Drug., 91 (1919), 437.

Pharmacopœial Suggestions.—*Relating to the German Standard.*—E. Richter suggests that chlorine water be kept in filled and sealed ampuls; that hydrogen sulphide solution be tested by the red color produced when treated with sodium nitroprusside and potassium hydroxide; that Dietze's reaction for peroxide (see YEAR BOOK, 1915, 268) be given in the ether monograph; that cork stoppers coated with collodion be directed for use for ether containers, and that only small quantities of tincture of iodine be directed to be prepared by the pharmacist.—Apoth.-Ztg.; through Chem. Abstracts, 13 (1919), 2962.

EDUCATIONAL PHARMACY.

Colleges of Pharmacy.—*Illinois Requirements for.*—The Department of Registration and Education of Illinois outlines the requirements of an approved College of Pharmacy necessary to meet the demands of the pharmacy law in that state. The features discussed are: incorporation, laboratories, course of instruction, faculty requirement, graduation requirement, admission requirements, definition of "unit," attendance requirements, advanced standing, promotions, systems of records and catalogs.—Nat. Drug., 49 (1919), 340. (C. M. S.)

Colleges of Pharmacy.—*Commercial Courses in.*—Edward Spease thinks a better title for this paper would be "Some Ideas on Pharmaceutical Education That May Be of Interest to the Commercial Druggist." Retail merchants, however high their ideals, should not be expected to do business at a loss. The laity's ignorance of drugs subject the dishonest to greater temptation than does any other profession or business.

Educators realize the importance of biological pharmacy, but they realize also that a thorough training in elementary bacteriology and chemistry must precede it and the length of time spent in the entire course is utterly inadequate to cover all the subjects a student should have. A good salesman "can handle and sell biologics to the full satisfaction of the manufacturer if he reads their literature and handles them solely as merchandise." Nevertheless, a druggist should know the quality of his merchandise whether it be biologics or galenicals or crude drugs. He must be taught salesmanship, advertising and business methods, but not at the expense of the scientific side. A "chain" store can hire specialists for each line, but the retail drug merchant cannot limit his knowledge to one line. Physicians argue that pharmacists will counter-prescribe if they are taught the therapeutic action of drugs, but the pharmacist knows that without that knowledge he cannot buy, preserve or compound drugs properly. Men do not "err in ethics and honesty because of too much knowledge" rather because they have "only touched the higher spots" but feel that they are completely educated.

The breadth of pharmacy has been underestimated. The public is not well served when manufacturers sell direct to physicians who diagnose their cases to fit the proprietary remedy while the druggist's stock deteriorates on his shelves. Likewise, the retail drug store is a better depot for biologics than the physician's office or the manufacturer's local office.

The reckoning is bound to come. The schools must help druggists to cope with business difficulties. To do this all standards must be higher: we must have high school entrance requirements, college courses must be lengthened to include more of economics and business and English and other requisites.—J. Am. Pharm. Assoc., 8 (1919), 190. (Z. M. C.)

Educational Standards.—J. W. Sturmer points out that the purpose of educational standards is to fix a minimum standard and raise the average standard for the public good and the public

protection rather than for the good of any single individual. While educational standards pertaining to medicine may add nothing to the greatness of the outstanding geniuses in medicine and surgery, it is sure to raise the average of efficiency and make charlatanry almost impossible. And similarly, increased standards in pharmaceutical education are providing pharmaceutical workers whose general average of efficiency is much above that of the pharmaceutical worker of the past. Pharmaceutical educational standards are eliminating the pretender, and the least capable of the graduates of to-day is vastly better equipped than the least capable of the graduates of a generation ago. We may therefore feel sure that the requirements of a full high school course as a requisite to pharmacy, to be universally operative in 1923, will not only be to the public interest and make for the advancement of the calling, but will actually benefit the young men and women who will be under necessity to conform to the new standards.—Proc. Penna. Pharm. Assoc., 42 (1919), 149. (R. P. F.)

Graduates.—*Status after Ten Years.*—Zada M. Cooper gives some statistics to prove that a high school entrance requirement for colleges of pharmacy will not cause graduates of those colleges to go into some other branches of the work in such proportions that retail pharmacy will not be adequately provided for.—J. Am. Pharm. Assoc., 8 (1919), 934. (Z. M. C.)

Pharmaceutical Latin.—*Pronunciation of.*—A. B. Stevens quotes from a number of books to show that there is no uniformity among teachers or texts in the pronunciation of pharmaceutical Latin. The principal argument for the Roman method is that it is used in our public schools. The English method is more easily acquired by English-speaking people and, with one exception, it is used by botanists in pronouncing botanical names. Botany comes early in the curriculum of a college of pharmacy and the student learns the names of many drugs. It seems absurd to pronounce the plant name as if it were English and the preparations of that plant by the Roman method. It naturally follows that those who use the Roman have the habit of fixing the two. The question should perhaps be settled by the Section on Education.—J. Am. Pharm. Assoc., 8 (1919), 110. (Z. M. C.)

Pharmaceutical Education.—*German.*—Zörnig believes that in all probability pharmaceutical education in Germany will in future

be arranged as follows: After passing a school-leaving examination (which may or may not be matriculation) the student will spend an apprenticeship of two years in a pharmacy and then pass to a three years' course of study at a university. This course will be divided into two parts; first a year and a half devoted to general science, followed by an examination in the same, and succeeded by a year and a half devoted to special pharmaceutical study, and followed by the State pharmaceutical examination. The general science course will be similar to that followed by students of medicine and natural science, though there may be variation in the subjects taken. The special pharmaceutical course will include pharmaceutical chemistry, chemical toxicology, urine analysis, the chemical examination of foods, pharmacognosy, hygiene, and bacteriology. After the State examination has been passed several years will be spent as an assistant in a pharmacy and the assistant will then be approved as fully qualified.—Pharm. Ztg.; through Pharm. J., 102 (1919), 199.

Pharmaceutical Education.—*Opportunities of.*—Henry J. Goekel's appeal to pharmacy to take up laboratory diagnosis and pharmacology is timely. He believes these diagnostic methods require more pharmaceutical and chemical knowledge than is given in colleges of medicine and that the regular pharmaceutical education and experience in prescription compounding is a better foundation for such specialization than pre-medical and medical courses. The author explains why he believes this to be true and cites some instances which expose the gap between clinical medicine and pharmacy. American pharmacy should bridge this gap.—J. Am. Pharm. Assoc., 8 (1919), 933. (Z. M. C.)

Pharmaceutical Standards.—*Past and Present.*—Pharmacists and physicians have always demanded standards but scarcity of sugar and glycerin, the quantity of chemicals from factories that have sprung up suddenly and the propaganda to induce people to gather wild medicinal plants all tend to make the problem of standards difficult. Work on standards by the Government and by various organizations old and new continues and should bear fruit. Edward Kremers, in his paper, exhibited proof of Dr. Du-Mez's manuscript on Oleoresins and examples of cards as a means of distributing and collecting encyclopædic information, both illus-

trative of phases of work on standards that deserve particular mention.—J. Am. Pharm. Assoc., 8 (1919), 124. (Z. M. C.)

Plant Chemistry.—*The Teaching of.* Nellie Wakeman well says that the conversion of air and water into food for living things is more marvelous than the miracle of the loaves and fishes. " $6\text{CO}_2 + 6\text{H}_2\text{O} = \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ " looks simple, but "if Germany had mastered the mysteries of this reaction the combined armies of the world could scarcely hope to bring her to her knees." Plant chemistry, though neglected, is important, particularly to pharmacists, for much of our materia medica is from plant sources and, moreover, pharmacists have been responsible for many of the advances along plant chemical lines. The material is inexhaustible. In teaching the subject, the first semester includes separation of starch from potato; preparation of fixed oil of almonds; separation into its constituents of a natural oleoresin like copaiba; a study of the part water has in biochemical processes; determination of moisture and ash; saponification and acid values of fixed oils, and resins and iodine numbers. In the second semester volatile oils get considerable attention not only because of their importance but because in them are found saturated and unsaturated hydrocarbons, alcohols, esters, ethers, aldehydes, ketones, and phenols. Carbohydrates, glucosides, tannins, pigments and protein products follow volatile oils. Class-room work and laboratory work are closely correlated. Students are encouraged to read and are required to keep careful notes of work done in laboratory and of discussions suggested by the Guide provided for the course.—J. Am. Pharm. Assoc., 8 (1919), 105. (Z. M. C.)

Pharmacy and Human Welfare.—In an address delivered at the Detroit Institute of Technology College of Pharmacy Commencement, Henry Kraemer eulogizes the humanistic work of the pharmacist. The speaker enumerates the achievement of pharmacists including their methods of drug assay and food analysis. In conclusion Dr. Kraemer states that the great essential for human welfare is the spirit of freedom; his motto being,

I have tolerated no evil,
Sophisticated no truth,
Nursed no delusion,
Allowed no fear;
And helped to make men free.

Pharm. Era, 52 (1919), 223. (F. H.)

Pharmacy.—*University Ideals in.*—In his annual report as the Dean of the New York College of Pharmacy, Prof. H. H. Rusby presents at length the situation as to pharmaceutical education in university schools. The essence of the article is that New York State and its schools adhere to the view that the surest way to attain final success in their efforts to obtain full professional recognition for pharmacy and pharmaceutical education is to proceed along the line of gradual development. The presentation of the subject matter is interesting and must be read in its entirety to be fully appreciated.—*Drug. Circ.*, 63 (1919), 174. (C. P. W.)

Research.—*Practicability in Pharmacy Colleges.*—C. S. Chase believes pharmaceutical research is practicable because of the immensity of the field disclosed by drugs that need pharmacologic assays and because of the anxiety of medical practitioners as to the probable effect of drugs they use. Dr. Chase cites the work done by a graduate student in the College of Pharmacy of the State University of Iowa in 1917-1918. The subject studied was the biological assay of cannabis, together with the complete history of cannabis from the date of its earliest appearance as a medicine.—*J. Am. Pharm. Assoc.*, 8 (1919), 198. (Z. M. C.)

GOVERNMENTAL PHARMACY.

American Red Cross.—*Pharmacy in Paris.*—G. L. Burroughs tells the nature of the work done, explains the necessity for the section and the form of its organization, describes the emergency service, pictures the warehouses, and gives statistics showing the sort of material furnished and the number of requisitions handled. It is a most readable article.—*J. Am. Pharm. Assoc.*, 8 (1919), 291. (Z. M. C.)

Army Days.—This is an entertaining article by H. E. Chapman, an army dispenser of the R. A. M. C. He describes his experience in Gallipoli, Egypt, Suez, Port Said, Libyan Desert and the Holy Land.—*Pharm. Jour.*, 102 (1919), 3. (C. P. W.)

Military Pharmacist.—*Belgian.*—The organization of the medical department of the Belgian army is discussed. It is mentioned that the pharmacist, although he does not have a military title, can rise

to the rank of *Pharmacien en Chef*, which compares to the ranking, and draws the pay, of Lieutenant-Colonel.—Chem. and Drug., 91 (1919), 960. (K. S. B.)

Military Pharmacist.—*British.*—Army Council Instruction No. 8 of 1919 provides that pharmacists in the British Army shall be classified as Superintending Pharmacists, Pharmacists and Dispensers. Superintending Pharmacists and Pharmacists shall include only those who are registered as Pharmaceutical Chemists or Chemists and Druggists in Great Britain, or as Pharmaceutical Chemists in Ireland, those showing sufficient ability to warrant their being placed in subordinate charge of a dispensary being classed as Superintending Pharmacist, the others as Pharmacist. Dispensers shall include only those who have passed the army examination for dispensers, those who hold diplomas as apothecaries' assistants from the Society of Apothecaries of London or Dublin, those registered as Chemist and Druggist or as Druggist in Ireland, and those who have been engaged in dispensing medicines for at least three years. Provision is made for giving necessary training in army procedure for new men. A Superintending Pharmacist is to be placed in subordinate charge of each dispensary located in a hospital of 100 beds or more, and is given the acting rank and pay of sergeant while so employed. In hospitals where three or more pharmacists or dispensers are employed, the Superintending Pharmacist is given the acting rank and pay of staff-sergeant. The dispensing personnel of a dispensary, other than the Superintending Pharmacist, may be either pharmacist or dispensers.—Chem. and Drug., 91 (1919), 73. (K. S. B.)

Military Pharmacist.—*Dutch.*—A description of the organization of the medical department of the Dutch Army is given, in which it is stated that the pharmacist may rise to the rank and pay of Lieutenant-Colonel or Major.—Chem. and Drug., 91 (1919), 1028. (K. S. B.)

Military Pharmacist.—*French.*—An article concerning the medical organization of the French Army gives the composition, ranking and duties of the various departments. It is stated that the pharmacist can rank as high as major.—Chem. and Drug., 91 (1919), 562. (K. S. B.)

Military Pharmacist.—*Italian.*—The organization of the medical department of the Italian Army is discussed, with special attention given to the status of the pharmacists who may rise to the rank of colonel.—Chem. and Drug., 91 (1919), 596. (K. S. B.)

Military Pharmacist.—*Russian.*—A discussion of the organization of the medical department of the Russian Army is given. The pharmacist may rise to the rank of State Councillor, which is the civil title corresponding to the rank of Colonel.—Chem. and Drug., 91 (1919), 1086. (K. S. B.)

Military Pharmacist.—*Spanish.*—G. R. Landa, Pharmacist Major of the Spanish Army, states that the latest reforms in the Spanish Army give added dignity to the Pharmaceutical Corps: one in particular, the privilege of receiving upon long and spotless service the most coveted military order of the world—the military order of San Hermenegildo. This new law also creates the Inspection of Pharmaceutical Services under an inspector with a general officer's rank, Brigadier General, assisted by four sub-inspectors of First Class, Colonels; fifteen sub-inspectors of Second Class, Lieutenant-Colonels; twenty-six Major Pharmacists, Majors; Fifty-one First Pharmacists, Captains; and forty-one Second Pharmacists, Lieutenants. This board will no doubt audit the Pharmaceutical Corps accounts, report on its investment of funds, etc. In addition, a complementary Corps of officers and assistants to a number equalling twenty per cent. of the total personnel of active register will be created yearly from men just completing their pharmaceutical education. Should there still be recruits after above quota is filled, the government urges these applicants to enter military factories of explosives and the laboratories associated with these factories.—Am. Drug., 67 (1919), 5. (M. D.)

Naval Pharmacists.—*Status in United States.*—The Medical Department of the United States Navy is divided into four distinct corps, medical, dental, hospital and nurses' corps, states Lt. Charles Schaffer, and of these the hospital corps, composed of enlisted men of the Navy, warrant officers ranking as Pharmacists and chief warrant officers known as Chief Pharmacists, handle drugs and other medical supplies and accessories. Lt. Schaffer describes the advancement of a hospital apprentice 2nd class from the lowest rating in the corps to the rank of Chief Pharmacist. the

highest rank in the corps. A man entering the hospital corps of the Navy without experience or professional training is rated as hospital apprentice 2nd class; one who has studied chemistry and pharmacy or who has had experience at nursing rates as hospital apprentice 1st class. In either case, the recruit is sent to one of the Navy Hospital Corps training schools for a six months' period of intensive training in pharmacy, materia medica, chemistry, first aid, hygiene, laboratory technic, special nursing, minor surgery, diet, operating room technic, the careful preparation of instruments for operations and the preparation and sterilization of all dressing materials. The men are distributed from these schools to different vessels of the fleet for further instructions under medical officers and pharmacists. The men are advanced in rating as fast as they succeed in their work as follows: pharmacist's mate, 3rd class; pharmacist's mate, 2nd class; then by examination and on record to pharmacist's mate, 1st class, then to highest enlisted rating in Hospital Corps—Chief Pharmacist Mate. A chief petty officer of Hospital Corps may advance to the rank of Pharmacist and then, after six years' more duty and extra examinations, he may become a chief warrant officer—Chief Pharmacist. The paper discusses at length the duties of the members of the Pharmaceutical Corps.—*Am. Drug.*, 67 (1919), 47. (M. D.)

Naval Pharmacist.—*Duties of the Fleet.*—W. F. Sheridan describes the duties of the Pharmacist attached to the U. S. Atlantic Fleet. The staff of the Admiral, composed of captains, commanders, lieutenant commanders, and lieutenants and their assistants, commissioned and warrant officers and yeomen of respective departments, have living quarters and offices on board the flagship of U. S. Atlantic Fleet. The fleet surgeon, a member of the fleet staff, is head of the medical department in the fleet and as such he is responsible for its health, sanitation and the prevention of diseases, concerning which he may issue all orders which are signed by the Commander-in-Chief. One of the duties of the Pharmacist, the Fleet Surgeon's assistant, is to record all that transpires at medical officer conferences; other duties of the Pharmacist are assisting at sanitary inspection of ships, embracing health of personnel, hygiene, sanitation, food, sleeping arrangements and cleanliness; the inspection of the records of ships medical department, inventory of property, storage and care of drugs and medical department supplies, compliance with Harrison Narcotic

Law. A typewritten report covering all details of inspection is made for Fleet Surgeon by Pharmacist. Besides this the Pharmacist takes care of all official correspondence and reports from Fleet's medical department to Navy Department, at Washington the Pharmacist also prepares these reports for the signatures of; the Commander-in-Chief and the Fleet's Surgeon.—*Am. Drug.*, 67(1919), 85. (M. D.)

Naval Pharmacist.—*Service with U. S. Destroyer Squadron.*—Being instructed to fear the worst, A. F. Kirchgessner always put a man with a stomach-ache to bed, gave an enema and applied ice pack to abdomen until a surgeon could ascertain if it were appendicitis or not. Although Mr. Kirchgessner had thirty men sick with influenza at the same time, not one case was lost. Though he never saw a German submarine, he was able to give medical assistance to two men rescued from a merchant vessel which had been sunk by one which was later destroyed by American and British destroyers. As the supplies come in small units, the requisition for the destroyer was very simple, although a full materia medica was carried. Medical dressings, some dispensary equipment, bedding, linen, books, and a small case of surgical instruments for minor surgery, such as the removal of splinters, opening boils, closing small wounds or the temporary treatment of toothache, were allowed.—*Am. Drug.*, 67 (1919), 50. (M. D.)

Naval Pharmacist.—*Recognition by France.*—The pharmaceutical staff of the French Navy is now to be officially styled *Pharmaciens-chimistes*, and to be graded as follows: One second-class general pharmacist-chemist, three first-class chief pharmacist-chemists, five second-class chief pharmacist-chemists, nine principal pharmacist-chemists, twenty first-class pharmacist-chemists, eleven second-class pharmacist-chemists, and third-class "varying according to the Service's needs."—*Chem. and Drug.*, 91 (1919), 1052. (K. S. B.)

Protecting the Sick Soldiers.—The Council on Pharmacy and Chemistry, aided by the A. M. A. Chemical Laboratory, did a great work in investigating and passing on the many medicinal products offered to the Surgeon-General for the treatment of the sick soldiers in the hospitals and in the field. Fakes of every description were offered the government and it is a well-known fact

that no matter how fraudulent, how fakish, or how ridiculous the wares might be, their promoters were able to get political influence, even certain congressmen and senators being secured to help them. Automatically all medicinal preparations offered to the Surgeon-General were referred to the Council and thus many worthless preparations were barred from use by the government. It has been well said that our soldiers were better protected than our civilians; for while the government does not take any chances on the acceptance of useless, if not worthless, medicinal preparations, yet there are any number of doctors who fail to profit by the findings of the Council on Pharmacy and Chemistry.—J. Ind. State Med. Assn., July 15, 1919, 196. (W. A. P.)

The War Lacuna.—Capt. R. A. Chell, a worker in and lover of pure science before the war, deplors the fact that many men who were scientific workers or advanced students now return from the war "rusty" and equipped with only a boy's knowledge upon any subject—bar soldiering. He states that science students would be greatly helped in getting restarted in their work if a short but comprehensive review on the progress of science during the war could be given in pamphlet form.—Pharm. J., 102 (1919), 249. (C. P. W.)

LEGISLATIVE PHARMACY.

Advertising Law.—*District of Columbia.*—L. F. Kebler states that this new law is the outgrowth of various attempts on the part of the Retail Druggists' Association to control unfair advertising. A Vigilance Committee appointed to look after the local situation found that without a law it was hardly possible of control. The law, finally obtained, is broad enough to cover every form of advertising and the punishment is \$500 or imprisonment for sixty days or both.

Mr. Kebler illustrates the working of the law as it applied to the first three cases taken into court before taking up medical advertising in which he summarizes the findings of a special committee. This formulated seven rules for the guidance of newspapers and further conferences resulted in the appointment of a Committee on Medical Advertising, made up of two druggists, two doctors and an attorney. The work was limited to false medical advertising, patent medicines honestly advertised and not injuring the public being undisturbed. Those that might cause

injuries and "Prescription Scheme Products" were taken up first. The retail druggists were asked to co-operate and newspapers were advised and with some exceptions have helped in improving conditions.—J. Am. Pharm. Assoc., 8 (1919), 201. (Z. M. C.)

Alcohol and Prohibition.—F. W. Nitardy directs attention to the alcohol law of Colorado, which provides for the sale of alcohol in two forms, "one consisting of grain alcohol containing one-tenth of one per cent. of croton oil, the other consisting of a mixture of alcohol and water containing one-tenth of one per cent. of tartar emetic." Pharmacy should give careful attention to the question of legislation that will provide less restriction in the use of tax-free alcohol. It is within the province of pharmacy to suggest formulas that cannot be used as beverages or converted into beverages.—J. Am. Pharm. Assoc., 8 (1919), 957. (Z. M. C.)

Alcohol.—*The Future of.*—Every pharmacist whether manufacturer or retailer must give thought to the alcohol supply. All are more or less annoyed by the labor attending the fulfillment of the regulations of the Internal Revenue Department. Because a few perverted individuals will indulge in tincture of Jamaica ginger and lemon extracts, A. B. Adams thinks that it is not sufficient reason for prohibiting their manufacture, but they should be standardized and every seller of such preparations must see that their use does not become abuse. If legitimate users of alcohol do not want still more restrictions they must keep the use and sale of alcoholic preparations clean. Mr. Adams believes that Congress intended that industrial users should benefit by the tax-free alcohol and that misunderstanding keeps many from applying. The Commissioner of Internal Revenue might grant permission to use a specially denatured alcohol in many preparations used externally if the question were properly presented and on condition that the manufacturer give a bond and comply with certain other restrictions. An ideal denaturant is needed and now is the time for manufacturing pharmacists to try to get together on some denaturing material that would make alcohol non-potable but fit for technical uses. Alcohol in the future should be more plentiful than during the war, but the price will be high so long as the revenue remains. Hence pharmacists should look to denatured alcohol to solve some of their difficulties.—J. Am. Pharm. Assoc., 8 (1919), 108. (Z. M. C.)

Austrian Ministry of Public Health.—*Creation of.*—An Austrian Ministry of Public Health has been instituted. Among the objects of its attention are: infectious diseases; veterinary matters; the practice of medicine and pharmacy; poisons; medical and pharmaceutical education; organization and support of all societies, which promote public health; arrangement for dealing with corpses.—Chem. and Drug., 91 (1919), 222. (K. S. B.)

Boards of Pharmacy and Medicine.—*Co-operation between.*—In discussing this question, F. E. Stewart states that the first step was taken by Congress when the U. S. P. and N. F. were made legal standards. State pure food and drug laws should be made to conform to the national law. There should be standardization of medicinal preparations not in U. S. P. and N. F. The Sherley Amendment should be enforced. A plan for the standardization of "alleged new therapeutic inventions" and another method for the introduction of new and useful medicinal substances should be adopted. All of these plans should be worked out by co-operation. In conclusion Mr. Stewart makes a number of specific recommendations that need to be read in their entirety.—J. Am. Pharm. Assoc., 8 (1919), 207. (Z. M. C.)

The Chemical Foundation.—This U. S. company has been incorporated to buy 4,500 patents formerly belonging to Germans. Licenses will be given by the Foundation to various chemical companies to use these patented processes. This protects the American market from competition with many German products which were not made here, the patents having been taken out merely to prevent American manufacture of the articles affected.—Chem. and Drug., 91 (1919), 544. (K. S. B.)

"For the Good of the Public."—*The Slogan for Successful Legislation.*—W. H. Ziegler believes that to obtain good legislation or block the objectionable kind it is necessary to convince legislators that it is for the good of the public. It is essential that a State association have an active man for president and a strong legislative committee. Mr. Ziegler believes that a prerequisite law is the keynote of the pharmaceutic problem. The American Pharmaceutical Association needs a larger membership that would make possible a more thorough organization. Then the public and pharmacists themselves can be educated to the importance of

pharmaceutical legislation.—J. Am. Pharm. Assoc., 8 (1919), 936. (Z. M. C.)

Health Insurance.—*Lack of Success of.*—It is stated that in spite of the health insurance in England, the death rate, especially among children, has increased, and tuberculosis is more prevalent.—Chem. and Drug., 91 (1919), 225. (K. S. B.)

Health Insurance.—*Profit to the Pharmacist from.*—The experiences cited by two English panel pharmacists may be of interest in view of the present agitation in some parts of the United States for compulsory health insurance. One man showed a gross profit of 34.6 per cent. on his health insurance prescriptions for six months, which was reduced to 19.6 per cent. by deduction of 15 per cent. for overhead expenses, which is the amount of his overhead calculated on the entire business. The second claims that insurance dispensing causes more than its proportionate amount of overhead, calculated upon its receipts, he apportioning overhead according to the time consumed in dispensing, preparing solutions, etc. Records kept by him on this basis during one month of the influenza epidemic showed that at the rates now allowed dispensers for health insurance prescriptions, their overhead charge was nearly $2\frac{1}{2}$ times their gross profit upon them.—Chem. and Drug., 91 (1919), 43 and 67. (K. S. B.)

Government-Owned Pharmacies.—*Serbian.*—In Serbia pharmacies have been declared to be public government undertakings. New pharmacies opened will be a charge to, and under control of, the Board of Health. Present owners continue in business, but upon their death the state assumes the store and indemnifies the heirs. The present owners may sell immediately to the state if they so desire.—Chem. and Drug., 91 (1919), 1021. (K. S. B.)

Narcotic Drugs.—*Control in Argentina.*—The importation and sale of opium and its preparations, cannabis, morphine and its salts and cocaine and its salts is controlled by an Argentine decree dated May 17, 1919. Importation, except by chemists and druggists with the concurrence of the Department of National Health, is prohibited. The name and address of the importer, the kind and quality of the narcotic drug, and the date of importation are kept in a register by that department. Sale of the drugs affected

is prohibited except upon the written order of a recognized medical authority. Provision is made for the inspection of druggists' stocks and sale registers.—Chem. and Drug., 91 (1919), 799. (K. S. B.)

Narcotic Drugs.—*Exportation Restrictions of Canada.*—Due to an Order in Council passed May 4, 1919, opium, its alkaloids, their salts, and cocaine and its salts, or preparations of any of these substances may only be exported from, or imported into, Canada under license issued on the recommendation of the Minister of Trade and Commerce.—Chem. and Drug., 91 (1919), 594. (K. S. B.)

Patents.—*Protection of New Therapeutic Agents.*—Pharmaceutical manufacturers have usually been ready to appropriate the results of scientific research by investigators or therapeutic measures suggested by practicing physicians. Not infrequently, in such cases, the desire for financial gain has caused the marketing of such products with extravagant, if not false, claims as to their value. Therefore, though it is unethical for physicians to receive remuneration from patents on medicines or instruments, it is important that new therapeutic agents discovered in our research institutions be protected by patenting them and thus to so control them that they may be available without subordination to commercial interests. In 1914, the House of Delegates of the American Medical Association passed a resolution to the effect that the board of trustees of the Association should accept at its discretion a patent on a medicine or surgical instrument, as trustee, for the benefit of the profession and the public, provided that neither the Association nor the patentee should receive remuneration for this patent. The Rockefeller Institute for Medical Research has solved the problem in a similar manner. Certain products discovered there have been patented. It is proposed to permit the manufacture of such discoveries under license by suitable chemical firms and under conditions which will insure the quality of the drugs and their marketing at reasonable prices. It is further announced that the Institute will not receive any royalties or pecuniary benefits from the licenses it issues.—J. Am. Med. Assoc., 73 (1919), 1219 (W. A. P.)

Proprietary Medicines.—*Publication of Potent Content of.*—Dr. Oscar Dowling believes that the potent content of proprietary medicines should be published. He gives many reasons for this

conclusion. The Food and Drugs Act with the Sherley amendment has been very effective so far as it applies; many druggists are tired of the patent medicine part of their business and its elimination would mean better pay and deserved recognition; honest physicians could use preparations bearing their formulas; manufacturers of worthy remedies need not fear loss.—J. Am. Pharm. Assoc., 8 (1919), 412. (Z. M. C.)

Proprietary Remedies.—*Validity of Provisions concerning.*—In the proceedings instituted by E. Fougere & Co., Inc., against the City of New York *et al.*, the Court of Appeals of New York holds that the provision of the sanitary code is not unconstitutional in that it prescribed the formula disclosure of medicines. The purposes and effects of the code were well within the police power and had the object of protecting the public. "No man has a constitutional right to keep secret the composition of substances which he sells to the public as articles of food" (*State v. Aslesen*, 50 Minn. 5, 52 N. W. 220). If that is true of food, it is even more plainly true of drugs. But there was one objection to the ordinance, though one that amendment might correct: that the ordinance did not except existing stores of merchandise in the hands of dealers, in that the board of health exceeded the powers delegated to it.—J. Am. Med. Assoc., 72 (1919), 753. (W. A. P.)

Specimen Examinations.—*Unsanitary Methods in Conducting.*—W. W. McNeary calls attention to certain unsanitary methods of the Pennsylvania Board of Pharmacy in conducting specimen examinations. He cites as an example the case of an applicant with a skin disease handling and tasting certain specimens which are later passed to another applicant to whom the disease may be transmitted. He suggests substituting for the specimen examination, which "at its best is but a guess," a written examination requiring the description of the characteristics of the specimens as to sight, smell and taste.—Proc. Penna. Pharm. Assoc., 42 (1919), 152. (R. P. F.)

HISTORICAL PHARMACY.

Aleppo.—*Ancient Drug Trade of.*—Aleppo, like Damascus, was formerly a place of immense importance in the trade of the East, being before the discovery of the Cape route on the high-road from Europe to India. From Tripoli, then the chief port of Syria, the

caravans started, and Aleppo, the great Mart—"the greatest place of traffique for a dry town that is in all those parts," said Eldred in 1583—was only a few days' journey away. The description given of it and its surroundings (including its famous gardens) by Ranwolff and other travelers, show it to have been as pleasant a place as it was important, and at the height of its prosperity its population is said to have been a quarter of a million. Ranwolff stayed there for some months and collected specimens of its flora for his great collection. The more important of these he describes at length in his ninth chapter. Here apparently he first met with *chaube* (coffee) and *tscherbeth* (sherbet). This was in 1573. He describes at great length the use (and abuse) of opium by the Turks. From Aleppo the caravans proceeded by way of Bir, Babylon and Balsara, to Ormuz, and thence to Goa, by sea. Eldred (in Hakluyt) has a list of 116 articles, mostly drugs and spices, carried by this route, with the charges on each.—Chem. and Drug.; through Pract. Drug., May, 1919, 39.

Anesthesia.—*Discoverers of.*—C. M. Ford relates in a most interesting way the history of the discovery of the anesthetic property of ether, with something of the controversy there has been about who is entitled to the honor and why this monument in Boston, donated by Thomas Lee, a Bostonian, bears no man's name. The evidence resulting from investigation of the claims of various individuals indicates that the honor should go to Crawford Williamson Long, a pharmacist-physician who lived at Jefferson, Georgia, and who performed a surgical operation upon a man anesthetized with ether, March 30, 1842.—J. Am. Pharm. Assoc., 8 (1919), 1034. (Z. M. C.)

Chemist.—*Etymology of.*—A lively discussion of this topic leads to suggestions: the word may come from *chymos*, juice or sap; *chymeia*, a pouring out; *Khem*, a name for Egypt; *chymia*, black art; or *Chêmi*, a name for Egypt.—Chem. and Drug., 91 (1919), 338, 353, 393, 407, 461 and 499.

Drug Jars.—F. Ashford White gives a brief interesting sketch of some of the ancient drug jars he discovered in and around Paris. He suggests as worth while seeing the collections of the School of Pharmacy, Paris, the Central Hospital Pharmacy, opposite Notre Dame, Louvre Museum, Cluny Museum (Italian pharma-

ceutical ware), the Lorraine jars of Louis XV period at Nancy Museum, and the Louis XIV ware at Hospital St. Germain. White has no doubt as to the origin of the drug pot, since the oldest specimens of pharmaceutical pottery, the "Alberello," is Oriental, and was no doubt brought to Spain from the Orient by the Moham-medans. The designs on most of the early Arabian jars are of a floral decoration or artistic effects of simple lines beneath a rich metallic glaze without an inscription to denote contents. When the potter's art traveled "across the Tyrrhene Sea" to Italy, changes were made in the shape and the markings of these jars: the urn with its handles of twisted snakes was as numerous as the alberello and decorations of arabesques on a white or blue ground were used. Ceramic art now traveled to France, where Nevers and Rouen became centers of manufacture. Nevers ware, a huge and handsome jar, was made for the wonderful "confections" or "electuaries" of those days. Another and perhaps the most characteristic and familiar of French drug jars, is the "chevette," a small jar with a very small spout, a receptacle generally used for oils and syrups. Many "chevettes" bear inscriptions denoting what they contain. Special bottles were made for the many distilled waters to be found in the old Pharmacopœias.—Am. Drug., 67 (1919), 453. (M. D.)

Ebert-Hallberg-Oldberg.—H. M. Whelpley relates many interesting incidents from the lives of these three great pharmacists. All were strong men of pronounced characteristics, who left their impress on American pharmacy and Dr. Whelpley's personal reminiscences are well worth reading.—J. Am. Pharm. Assoc., 8 (1919), 297. (Z. M. C.)

Eclectic Compounds.—*Old Time.*—J. U. Lloyd comments upon the tendency of using newer remedies to replace the old and traces several instances where the more modern remedy has in turn been relegated to second place or been consigned to oblivion. Occasionally there is a break in the cycle and the remedies survive either in professional practice or in the form of well-advertised proprietaries. As illustrative of the survival of really useful remedies the writer names and discusses a number of preparations which are as popular with the present generation as they were with the past.—Drug. Circ., 63 (1919), 7. (C. W. B.)

Itinerant Physician.—*Ancient Hebrew.*—S. S. Cohn presents a translation from the Hebrew of a chapter of "Tachkemoni" by Rabbi Judah Alcharisi, written 1165–1225, describing the chant of an itinerant physician in Ba'al Gad in the valley of Lebanon, who is attempting to sell various remedies.—*The Medical Pickwick*; through J. Am. Pharm. Assoc., 8 (1919), 628. (H. H. S.)

Lancaster.—*Old Time Drug Store.*—C. D. Schuman relates many interesting bits of history connected with the Parry Drug Store of Lancaster, Pa. This store was bought by Ely Parry, M.D., from Washington Atlee, M.D., in 1838. Dr. Parry's son bought the store in 1860 and conducted it under his name. H. B. Parry ground all his vegetable drugs with mills operated by an engine. It was also at this drug store that Dalby's Carminative, a well-known pharmaceutical preparation, was prepared for sixty years from the original formula purchased from Dr. Dalby by Ely Parry. Schuman tells of two interesting events which apparently occurred at regular intervals—the gathering of men around the stove of the store, where a peck of peanuts was roasted for the use of all, and the visits of one Dr. Neff, a surgeon of the Civil War, who would eat one-half to one ounce or more of gum opium at a visit. Upon one visit the old doctor ate one ounce and two drachms of best Turkey opium, after which he slept two hours; when he awoke he took an ounce of sweet spirit of nitre and one-half ounce of laudanum and was soon as bright as ever.—*Am. Drug.*, 67 (1919), 145. (M. D.)

New York.—*An Old Drug Store.*—A brief history of the Quackinbush Pharmacy, at 703 Greenwich St., New York. The store was founded in 1817, has been doing business continually for 102 years in the same block, was owned by one family all that time. There has been no change in employees in the last 19 years.—*Drug. Circ.*, 63 (1919), 164. (C. P. W.)

New York.—*An Old Drug Store.*—A brief description of a drug store located at 28 Fulton Street, New York City, established in 1806 by Dr. S. A. Brown and now owned by Thomas W. Tucker. Ships departing for the Dutch East Indies or the African Gold Coast used to fill their medicine chests at Dr. Brown's Pharmacy. One may see some of these old chests at the store now.—*Drug. Circ.*, 63 (1919), 314. (C. P. W.)

Nostrums of Our Grandfathers.—At the 1918 meeting of the Missouri Pharmaceutical Association, A. N. Doerschuk read a paper stating that when he moved his store from the old Harris House of Westport, famous as a Santa Fe Trail hostelry and as the headquarters of the Union commanders at the battle of Westport, he came across a box in which many of the old-time patented remedies had been junked, an heirloom of the Dr. Boggs days. These were mostly in the pill form for the reason, Mr. Doerschuk explained, that at that early day patent medicines had to be made up in highly concentrated form owing to the high carriage rates and the dangers of breakage in transportation. These medicines were usually in the shape of bottled or boxed pills, which were taken home by the purchaser and kept, as a rule, in the old Seth Thomas clock, and administered by the head of the family with almost religious ceremony. One bottle resurrected was "Helmhold's Highly Concentrated Fluid Extract of Sarsaparilla," which was the first "sarsaparilla" offered on the American market and which sold at big prices in the western mining and Coast Cities of early days. It was one of the most popular of the old patent medicines, but it has long since been "extinct." The label is a work of art—a steel engraving showing the Helmbold chemical factory in St. Louis, with customers entering and leaving, the women in wide flowing, hoop-skirted dresses, and the men in the bell-shaped trousers, long coats and stovepipe hats of 1860.—*Pharm. Era*, 52 (1919), 149.

Percolation.—*Early History of.*—James F. Couch reviewed the early history of this subject and obtained sufficient material to evidence the fact that American pharmacists have done more to develop and apply the process of percolation than any others. He brings out that percolation was unknown as a pharmaceutical process as late as the beginning of the eighteenth century. The result of his literary research on this subject leads Mr. Couch to conclude that MM. Boullay, père et fils, deserve the credit for establishing percolation as a pharmaceutical process; to MM. Boutron and Robiquet go the credit for introducing the process into the methods of organic chemistry; Guillermond, Soubeiran and Dausse deserve special credit for their careful investigations of percolation, which did much to further the use of the process in pharmacy. Mr. Couch also makes the statement that no authentic evidence exists showing that German apothecaries were acquainted with

the principles of percolation previous to the publication of the investigations of French apothecaries.—*Amer. J. Pharm.*, 91 (1919), 16. (J. K. T.)

Pharmacy.—*Contributions to Civilization.*—At a meeting of the Baconian Club of the University of Iowa, Zada M. Cooper showed how pharmacy's influence has been felt in the world from ancient times to recent 19th century achievements. Miss Cooper gives an interesting sketch of cascara, which, after many adventures, was put on the market in 1872 by one Donnelly, a carpenter, as Donnelly's Discovery. The specific name *Purshiana* (*Rhamnus Purshiana*) was given to honor the German botanist, Pursh, who after careful study of the barks of cascara, gathered throughout the United States, wrote a book on the subject in 1814. Though knowledge of many drugs was empirical, yet their history is very interesting: one type is Cinchona, which cured a royal lady living in Peru around 1638 of a very bad fever. Its wonders were heralded to the Old World, where it was finally prepared and administered by Robert Talbot. Dr. John Huxham used his tincture, now surviving in modified form as compound tincture of cinchona.

The paper discusses the pharmacy of the Bible; of the Arabians, Geber, Avicenna and Serapion; of the Greeks, Dioscorides, Pythagorus and Galen; of the Middle Ages; of the Renaissance and then turns to the early and modern English and French physicians and pharmacists, whose preparations are parts of the stock of the present-day American pharmacist.—*Am. Drug.*, 67 (1919), 202 and 251. (M. D.)

Dr. Lyman Spalding.—*Sketch of.*—At the Johns Hopkins Hospital Historical Club, Dr. Henry M. Hurd read an interesting account of the life and work of Dr. Spalding. The author of this brief sketch obtained his data from a memoir entitled "The Life of Dr. Spalding," which was written by his grandson. It was Dr. Spalding, as most pharmacists will remember, who first began to agitate the question of a national pharmacopœia. He pointed out the great need for uniformity in medicinal preparations and the desirability of doing away with local remedies of no value. The first general convention was held in Washington on January 1, 1820. Dr. Spalding was a delegate and the plan proposed by him for carrying on this important work was adopted and has been practically followed ever since.—*Amer. Jour. Pharm.*, 91 (1919), 371. (J. K. T.)

Charles Tanret. *Life and Work of.*—Henry Kraemer writes interestingly of this commanding figure in pharmacy. Tanret was born on August 10, 1847, in the small town of Joinville, in Haute-Marne, on the Lorraine side of the boundaries of Champagne. He died July 29, 1917. Tanret was an active retail pharmacist with an investigative mind; this highly desirable quality, combined with the faculty of persistent industry, soon made him an outstanding figure among those of his calling. In the course of his busy life he published nearly 100 papers, representing research of the highest order. His work on ergot and pomegranate bark and the test which he formulated for the detection of albumin, peptone and alkaloids will make him long remembered.—*Amer. J. Pharm.*, 91 (1919), 265. (J. K. T.)

WOMEN IN PHARMACY.

Woman Pharmacist. *Experiences of a.*—Mrs. May O'Connor Davis in a paper read before the New York Branch of the American Pharmaceutical Association in an amusing strain describes some of the interesting experiences she had since she entered pharmacy. A few unusual orders and prescriptions are described. The author believes that the hospital pharmacy is a fine field for the woman pharmacist.—*J. Am. Pharm. Assoc.*, 8 (1919), 561. (H. H. S.)

GEOGRAPHIC PHARMACY.

Argentina. *Pharmacy in.*—H. Herzfeld in describing pharmacies of Argentina states that the pharmacists of this country are educated as professional men and that soda fountains, cigars and other side lines are not in evidence. Stringent laws regarding education, store management and inspection are in force. Physicians cannot dispense drugs or have any interest in a pharmacy. The pharmacy schools are departments of universities; courses being three years for graduate and five for doctor's degrees. Six years of high school work is the prerequisite for entrance to these courses. Speaking of nationalities represented, the writer notes that there are no North Americans represented or engaged in the drug business of the country.—*Pharm. Era*, 52 (1919), 3. (C. W. B.)

Belgium. *Condition of Pharmacy during the War.* The difficulties encountered by pharmacists in practicing their profession

in Belgium during the occupation of that country by the Germans are described in an article by M. Delacre.—*Chem. and Drug.*, 91 (1919), 1. (K. S. B.)

Belgium.—“*Pharmacien*” and “*Chimiste*” in.—L. Maertens gives an instructive account of the requirements in Belgium for qualification as a pharmacist and for the admission of holders of non-Belgian qualifications to the practice of pharmacy in that country.—*Pharm. J.*, 102 (1919), 408. (C. P. W.)

Belgium.—*Drug Prices in.*—A. Schamelhout, a pharmacist of Ixelles, Brussels, gives an interesting account of conditions of pharmacy in Belgium during German rule. Particularly interesting is the list of wholesale prices for drugs in 1918, which he publishes.—*Chem. and Drug.*, 91 (1919), 69.

Chinese Chemist's Shop.—The “Far Eastern Review” depicts two classes of Chinese retail drug stores: the prosperous store with its large blank wall instead of windows, and the less wealthy with windows like ordinary shops.

The galenicals consist of stewed pears and plums and admixtures of other ingredients for the purpose of enhancing their value (for the druggist if not for the patient).

Both doctor and chemist are apprenticed for a term of years. As neither the disease nor the potency of the drug is known, small errors in compounding do not cause any inconvenience.—*Pract. Drug.*, May, 1919, 32. (F. H.)

Dutch East Indies.—*Pharmaceutical Products.*—During the war the manufacture of pharmaceutical preparations in the Dutch East Indies increased greatly, oil of chenopodium, ether, tannalbin and several extracts, as well as pertussin and other proprietaries, having been produced.—*Chem. and Drug.*, 91 (1919), 75. (K. S. B.)

France.—*Pharmaceuticals in.*—C. L. Eddy describes the small professional drug stores of provincial France. He outlines the educational and professional status of the “*pharmacien*” and of the “*herboriste*” and points out the difference between their respective spheres of business. The barber or “*coiffeur*” also receives his due share of consideration.—*Drug. Circ.*, 63 (1919), 215. (C. P. W.)

India.—*The Pharmacist in.*—Profitable and interesting opportunities are offered to the wide-awake young pharmacist in India, Burmah and Ceylon; that is, to the young man who can become an all-round man in many industries foreign to pharmaceutical practices and who is best with a Kipling turn of mind for romance, says "Triste Lupus." The writer then gives some valuable hints as to salary to expect and the pitfalls to avoid when signing the contract which is made usually for three years and also suggests that the salary be paid in rupees and not sterling, because rupee exchange greatly fluctuates. Triste Lupus advises the "all-round" candidate to brush up on bookkeeping, double entry, on the technique of water and wine analysis, learn to vaccinate, test eyes, fit spectacles, have some veterinary knowledge, also something of microscopy. The study of oriental life, religion, language and literature and customs greatly repays that pharmacist who uses all his spare time, and he has much of it, in carefully gleaning all that the Hindoos may offer.—Pharm. J., 103 (1919), 484. (M. D.)

Mexico.—"Boticas" and "Drogerias" of.—Two kinds of drug stores found in Mexico are described by H. C. Collins, of Vera Cruz, Mexico. The retail drug store at which prescriptions may be compounded are called boticas. The drogerias are larger and do both a wholesale and retail business, but are not so accustomed to compound prescriptions. They are the importers of drugs sold in Mexico. Drugs are likewise sold in hardware stores.

American certificates are not recognized and it is necessary to pass an examination in Mexico to become professor or titled pharmacist, usually the only person to whom the charge of the prescription department is given and the one responsible for all mistakes made in the store.—Pharm. Era, 52 (1919), 227. (F. H.)

Polyglot Pharmacy.—*In New York.*—L. Lodian describes the many kinds of foreign pharmacists in Manhattan. The author mentions such characteristic wares as the Oriental rice-bran "soap," "Cherry Pectoral" and compressed disks of tea from the Mongol-Manchu stores; the date, raisin and palm sugars from Arabia; Nipponese "rubber goods" made of bamboo fiber paper, while from the Latin drogistas we have the chocolate and prickly pear juice beverages. Pharm. Era, 52 (19), 227. (F. H.)

In another paper Lodian states that whole sale drug price lists are published in the following idioms: Mongolian, Arabic, Persian,

Armenian, Greek, Russian, French, German, Italian and Scandinavian. They testify to the strange cosmopolitanism of New York's drug trade. He describes the Chinese drug store, and locates the centers of Arabian, Italian and French people in New York. Peculiar drug trade articles on sale at Japanese stores are hot water bottles and air cushions made of multi-ply rice paper, coated with a flexible shellac water-impermeable solution. They are durable and give good service. Another interesting article sold is a whalebone-back toothbrush of great flexibility. The drug dealers earn but little money; yet take their fate philosophically.—*Drug. Circ.*, 83 (1919), 57. (C. P. W.)

COMMERCIAL PHARMACY.

Advertising.—Jacob Diner discusses the various methods of advertising applicable to the drug store, particularly emphasizing the use of show windows; the store arrangement; personal or direct individual advertising and service.—*Proc. N. J. Pharm. Assoc.*, 49 (1919), 53. (J. H.)

Capital.—*Its Relation to Business.*—H. S. Noel directs attention to the various elements of capital; good will, a good clerk, good window displays, merchandise, money, credit and, above all, character. He discusses the danger in being lured into overstocking because of quantity prices, and emphasizes the importance of frequent turnover, illustrating his points by a number of excellent examples. The paper is worthy of careful study by those who would understand the subject.—*J. Am. Pharm. Assoc.*, 8 (1919), 944. (Z. M. C.)

Cost of Doing Business.—Richard H. Lackey raises the question whether pharmacists have increased their prices sufficiently to cover the increase in clerk hire and cost of materials.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 205. (R. P. F.)

The Druggist.—*Place in Community Life.*—At the meeting of the Indiana Association, Charles Genolin strikes the keynote of his article when he says "the druggist should quit his small 'measly' way of being only for *self*." To accomplish the removal of "*self*," Genolin suggests that all druggists join their State association because the association is for the druggists in all affairs concerning

the community, as to its morals, health and happiness. Then, too, by joining his association, the druggist cannot but help to grow bigger in his outlook and thereby acquire a cheery, genial disposition rather than the reverse, a grouch, who surely cannot be of any assistance when dealing with all sides of the human being, as the average druggist must do in his daily work. The wide-awake, honest, live-wire druggist is the best asset an association can have, for, being such, this kind of a druggist will back to a man every effort his association makes to improve the conditions of the community, to overcome petty jealousies of allied professions, to weed out the bad and indifferent and see to it that all keep the law and peace. In union there is strength; the wise, capable druggist and his association will always be a powerful union.—*Am. Drug.*, 67 (1919), 349. (M. D.)

Druggists.—*Insurance for.*—S. S. Huebner directs attention to the very great importance of elimination of risk from the business of druggists and reminds us that the various forms of insurance are for that purpose. Life insurance is of much more importance than any other. The druggist's life "has a value that should be capitalized and conserved." Mr. Huebner discusses also the relationship existing between life insurance and business enterprise as well as its relation to saving. Fire insurance and liability insurance are considered also.—*J. Am. Pharm. Assoc.*, 8 (1919), 836. (Z. M. C.)

Drug Store.—*Buying for.*—C. W. Holzhauer discusses this subject under five heads: what to buy, when to buy, where to buy, how much to buy and what price to pay. The paper has many valuable suggestions based on sound business principles.—*J. Am. Pharm. Assoc.*, 8 (1919), 837. (Z. M. C.)

Drug Store.—*Is It Becoming Too Commercial?*—W. W. Figgis discusses the question of commercialism in drug stores. He claims that the prescription and manufacturing is the barometer of all drug stores. Prescription niceties and other little touches give tone and prestige and tend toward professional dignity. The drug clerk should have an ample store of technical knowledge about the merchandise he is endeavoring to sell. The author is unqualifiedly of the opinion that it pays a druggist to put up his own preparations rather than sell his good name for a paltry profit by

establishing the reputation and pushing the sale of goods put up by and under the name of somebody else.—*Drug. Circ.*, 63 (1919), 498. (C. P. W.)

Drug Store.—*Working Hours in.*—W. A. Rumsey discusses the need for arranging working hours of clerks on a basis comparable to other lines of business. When he started in the drug business, a 70-hour week was considered satisfactory. He now has in force a 55-hour week in a three-week shift, the store being open from 7 A. M. to midnight. First week, clerk works 7 A. M. to 6 P. M., with every night and one afternoon off. Second week, clerk works 12 noon to 11 P. M., with every morning and one full day off. Third week, clerk works 1 P. M. to midnight, with every morning and one full day per week off. The Sunday work is arranged so that on first Sunday, clerk is off all day; second, relieves at meals; third, works 8 A. M. to midnight, with following Monday morning and afternoon off.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 241. (R. P. F.)

Drugs.—*A Druggist Should Know His.*—Dr. F. B. Kilmer emphasizes the need of the pharmacist becoming thoroughly conversant with drugs and medical appliances if he would be of real service and successful in his chosen calling. He very pertinently says: "Let your customers know that you keep a drug store." The pharmacist should know drugs and all there is to be known about them. Unquestionably he should know the pharmacology of the drugs he handles; such knowledge would enhance his value to the physician, as the latter's knowledge of this subject is not always profound. Dr. Kilmer thinks that the physician has no time or opportunity to really study drugs. He gives a list of drugs in common use and asks the pharmacists to question themselves as to what they know about them. It is good practice. Without consulting a textbook, describe their characteristics as to appearance, taste and odor. He pleads with young men of the profession to become real pharmacists and devote earnest attention to the study of drugs.—*Am. J. Pharm.*, 91 (1919), 139. (J. K. T.)

The Pharmacist and His Bank.—*Closer and More Profitable Relations between.*—C. O. Bigelow directs attention to the added profit accruing to druggists when they borrow money from their banks in order to take advantage of every discount offered them.

Pharmacists generally should discuss their affairs freely and fully with their bankers in order to establish close and profitable relations.—J. Am. Pharm. Assoc., 8 (1919), 750. (Z. M. C.)

Pharmacists' Own Preparations.—W. W. McNeary urges pharmacists to make, rather than buy, preparations sold under their names, such as corn removers, tooth washes, antiseptics, etc., claiming that greater profits will result, together with a clear conscience because of definite knowledge of the composition of such products.—Proc. Penna. Pharm. Assoc., 42 (1919), 267. (R. P. F.)

Pharmacist.—*From the Manufacturer's Viewpoint.*—R. C. White tells us that a good retail druggist rarely looks for a position with a manufacturing concern. A practical man usually makes good anywhere. Apparently there is an idea afloat that manufacturing lines offer easy jobs since so many applicants have been indifferent students or are looking for big pay for little labor. Manufacturer and retailer should "view the question of help from the common standpoint of need" for their interests, so far as labor is concerned, are similar. To succeed in either branch a man must be practical. Colleges cannot turn out a finished product. At best they can only turn out students ready to begin real practical life. "Rarely does a successful retailer make a good manufacturer, and more rarely does a manufacturer ever become a successful retailer." Their practical training after college must differ. Mr. White believes that colleges need to modify their courses in order that their graduates may more readily acquire the training for manufacturing. Even though eighty per cent. of the graduates go into retail business, more emphasis should be placed upon the compounding in a large way. The main question is how colleges can develop not only the practical retail pharmacist but also the practical manufacturing pharmacist.

The practical man must maintain his health. He must acquire experience, he should benefit by the experience, he should benefit by the experience of others through pharmaceutical associations. He must believe in his business, himself and his fellow-men.—J. Am. Pharm. Assoc., 8 (1919), 193. (Z. M. C.)

Pharmacist's Package.—*A Factor in Merchandising.*—F. W. Nitardy's reminder that business reputations have been made

and unmade by external appearances is every bit as true as the saying that "clothes make the man." The examples he cites are well chosen: the Spirit of Camphor bottle, with its cork in crooked and its label on crooked, paste showing, pencil marks across the face, dust on the outside and dust on the inside; the tincture of iodine bottle, with too small a cork, too large a label, and tell-tale bluish finger marks; unevenly filled and finger-marked quinine capsules in a box with a lid too loose and with label written in pencil. The moral is so obvious that no thoughtful druggists need to have it pointed out; on the other hand, the fact that such examples are ever to be found makes Mr. Nitardy's reminder apropos.—J. Am. Pharm. Assoc., 8 (1919), 32. (Z. M. C.)

Pharmacist's Objective.—Mrs. H. R. Kenaston believes that after adequate college training and a certificate of registration have been acquired a pharmacist should seek "to excel in one or more definite and clearly defined lines selected and specialized upon." Each day should bring greater professional efficiency. "The retail pharmacist is a requisite factor in the body pharmaceutical." They must provide tested and standardized therapeutic agents.—J. Am. Pharm. Assoc., 8 (1919), 215. (Z. M. C.)

Profits in Turnover.—By turnover, H. S. Noel says that he means "stock turns and by stock turns—turnover." There are three methods for determining rate of turnover; dividing the total sales by average inventory at cost; dividing sales at selling price by inventory at selling price; and, dividing sales at cost, by average stock on hand at cost. Mr. Noel prefers the last method and gives some excellent examples by way of illustration. Frequent conversion of merchandise into cash promotes turnover. Too many druggists guess at net profit and cost of doing business. "An accounting system is to the druggist what the steam gauge is to the boiler." Not all of the advantages in merchandising are with big stores. They have the benefit of greater capital but system and accounting methods of small stores may equal those of larger ones. Quantity purchases necessitate room for storage and quick turnover and seldom bring better than fifteen per cent. cash discount. Instead of imitating the chain-store method of purchasing in quantities the small store should attempt to convert small purchases into cash as frequently as possible. A ten per cent. discount on quantity is an expensive bargain unless the goods are

turned into cash in sixty days. When such men as J. Ogden Armour, Wm. H. Ingersoll and John A. Bush emphasize the danger of overstock and the profits in quick turn of stocks, their statements should have weight. "The way to take your business out of the single-cylinder class and put it into the twin six class is to know where you are at all of the time."—J. Am. Pharm. Assoc., 8 (1919), 130. (Z. M. C.)

Repetition Makes Reputation.—W. N. Figgis should have no difficulty in convincing his readers that "repetition of any fixed course of procedure establishes a reputation which is either calculated to inspire confidence or create suspicion." The cumulative effect of what customers say not only may become a "continuous advertisement" but a "permanent liability." Change of policy may not be enough, possibly there should be a transformation in the proprietor himself. Systematic self-examination should be the rule. A recent Bradstreet report said that "Four-fifths of all business failures result from tendencies present within the individual himself, and the remaining one-fifth is due to extraneous conditions over which he has little or no control." The proper mental attitude should become a habit, whatever is good should become part of the warp or woof of personality. As the rose and the onion grow in the same soil, so "we have it within our power to extract from life's environment what constitutes the fundamental basis of our dispositions." He who would be efficient must never be self-complacent. "A wish-bone can never be substituted for a backbone;" it takes "aggressiveness mixed with caution, optimism combined with horse-sense" to make efficiency possible.—J. Am. Pharm. Assoc., 8 (1919), 35. (Z. M. C.)

Retail Druggist.—*Future as Manufacturer.*—F. T. Stone believes that drug stores would not be much bothered by inspectors if proprietors were not obliged to delegate the compounding of many preparations to clerks who are often irresponsible. Supplies that are of proper quality will produce finished products showing a variation of 20 per cent., in the hands of different clerks. It is not possible to assay all of these, particularly now that competent help is so scarce, and for this reason Mr. Stone believes that large responsible manufacturers should be encouraged to produce standard and uniform preparations and the retailer should make use of them.—J. Am. Pharm. Assoc., 8 (1919), 213. (Z. M. C.)

Selling and the Pharmaceutical Profession.—Herbert W. Hess discusses this problem from the standpoint of one outside the ranks of pharmacists who understands business principles. He emphasizes the effect of personality, the value of a correct application of the professional point of view, and explains the three phases of selling—advertising, salesmanship and analysis of merchandising problems.—J. Am. Pharm. Assoc., 8 (1919), 939. (Z. M. C.)

Soda Fountains in Drug Stores.—At the time National prohibition became effective the number of soda fountains in the country was estimated to be 77,500, of which 39,000 were located in drug stores, which do an annual business of \$220,000,000, or more than \$6,000 per store. The following table shows the amounts spent by the public at the soda fountains of the United States for the years given:

1889.....	\$100,000,000
1894.....	120,000,000
1899.....	170,000,000
1904.....	210,000,000
1909.....	300,000,000
1914.....	485,000,000
1917.....	640,000,000

—Soft Drink Journal; through Midland Druggist, 53 (1919), 120. (A. G. B.)

DISPENSING PHARMACY.

Camouflage.—S. L. Hilton directs attention to the following prescription:

R Plumbi Acetatis.....	5i
Tincturae Opii.....	3iv

Misci, et signetur: To be used as directed.

It "is an example of scientific thought to provide a method for obtaining narcotics." The gums and resins are separated by the lead acetate and it in turn can be removed with dilute sulphuric acid. Filtration leaves a 10 per cent. hydro-alcoholic solution of opium.—J. Am. Pharm. Assoc., 8 (1919), 752. (Z. M. C.)

Conservation by Utilization.—J. C. Peacock would have us conserve capital by utilizing stock and shows how applicable the

plan is to drugs coming under the Harrison Act. Inventories are likely to show an accumulation of various preparations of many strengths and makes due to a falling off in the quantities prescribed since the law's enactment. Prescriptions calling for these drugs will show many instances where tablets and triturates may be crushed and used instead of the drug itself. Portions of several packages of the same strength may be put together and then tied to the container of the drug itself. This saves space, avoids unnecessary re-orders and does not tax one's memory. Time is required to look after such details, but it means the ultimate consumption of this excess stock and corresponding conservation of capital. Only proper uses are intended—"deceit cannot qualify as conservation."—J. Am. Pharm. Assoc., 8 (1919), 197. (Z. M. C.)

Dispensing Hints.—G. G. King points out the importance of long and thorough trituration necessary to mix powdered drugs and chemicals properly. He also states that to prevent filter papers from breaking when a plug of cotton placed in the neck of the funnel is not practical, a piece of cheesecloth or muslin folded along with the paper will prevent such things as acids or alkalies from eating through the paper. For precipitates such as barium sulphate, which will ordinarily pass through paper, a Gooch crucible prepared with asbestos should be used.—Pract. Drug., Dec., 1919, 18. (H. H. S.)

Laboratory Notes.—Under this title, T. D. McElhenie makes a number of suggestions for improving U. S. P. and N. F. formulas. He uses interleaved editions of the United States Pharmacopœia and National Formulary and finds his notes always accessible.—J. Am. Pharm. Assoc., 8 (1919), 556. (Z. M. C.)

Percentage Solution.—*What Is a.*—A symposium on the question of whether a physician writing a prescription for a percentage means a weight to weight or a weight to volume solution. The question is answered and discussed from many angles by prominent teachers and pharmacists, such as Geo. C. Dickman, E. A. Ruddiman, W. L. Scoville, P. H. Utech, Clyde M. Snow and L. D. Havenhill.—Drug. Circ., 63 (1919), 367. (C. P. W.)

Pharmaceutical Notes.—Under this title W. R. White relates some of his experiences in manufacturing and his success in over-

coming some difficulties.—J. Am. Pharm. Assoc., 8 (1919), 557. (Z. M. C.)

Photographic Formulas.—*Some Fundamental Considerations in Dispensing.*—Irwin A. Becker directs attention to difficulties likely to arise from the use of formulas of British origin, many of which are reprinted in the United States without noting the difference between Imperial fluidounces and U. S. fluidounces.

To be of assistance to one's trade in photographic goods it is necessary to understand the difference between the ordinary or non-color plates or films, the "orths" or "iso" chromatic ones, and those sensitized to all colors.

Mr. Becker explains briefly, but very accurately, the part taken in any developer by the reducer, the preservative, the accelerator and the restrainer. He also emphasizes the importance of balance of the various ingredients in a developer in order to obtain any specific effect. Sequence in mixing is not to be disregarded. The degree of hydration of the sodium salts must be observed and the necessary adjustments of quantities made if any other than that specified is used. Use of "Photographic" brands insures the required degree of purity and anhydration.

Pharmacists should be able, too, to help the amateurs among their customers in the modification of negatives or prints, particularly "intensification" and "reduction."—J. Am. Pharm. Assoc., 8 (1919), 829. (Z. M. C.)

Prescription Clinic.—C. H. LaWall and Ivor Griffith discuss ten prescriptions that are incompatible or have been reported to be incompatible, showing in some cases how the difficulties may be overcome and explaining the nature of the trouble, and in others that the incompatibility is unavoidable. There is much valuable information for the compounder, but reference to the original is necessary since it cannot be further condensed and be of value.—J. Am. Pharm. Assoc., 8 (1919), 120. (Z. M. C.)

Prescription Counter.—*Behind the.*—In a paper presented at the 1918 meeting of the Minnesota Pharmaceutical Association, R. Bartleson brings out a number of useful points on topics such as: scale salts with glycerin, saturated solution of potassium iodide, making Bland's pills, short cut in making suppositories by hand, etc.—Drug. Circ., 63 (1919), 62. (C. P. W.)

Prescription Department.—*What of the.*—An interesting survey of the present condition of the prescription business in the entire United States as compared with that of five years ago. An increase in the prescription business is reported in New York State and the Middle West, while the West, the South and the North-eastern States report a decrease. It is almost uniformly reported that more capsules and tablets are used and fewer pills and powders, ointments are more seldom used, and "shotgun" prescriptions are rarely met with.—*Drug. Circ.*, 63 (1919), 265. (C. P. W.)

Solids in Liquids.—*Notes on Suspension of.*—F. W. Nitardy has found that emulsification of the vehicle prevents separation of heavy powders from oils. Mercuric salicylate in almond oil begins to settle immediately and in twenty-four hours will be entirely deposited. By replacing twenty parts of the oil with anhydrous wool-fat and five parts with water, the powder does not settle even on several weeks' standing, and the trace of clear oil at the top is easily reincorporated.—*J. Am. Pharm. Assoc.*, 8 (1919), 961. (Z. M. C.)

THE PHARMACIST IN LITERATURE.

Kingsley's Pharmacists.—E. Kremers, in reviewing Kingsley's "Two Years Ago," finds many interesting passages dealing with the several classes of English or medico-pharmaceutical practitioners prevalent in this period of "laissez faire" England about 1857, when the Christian Social Movement was at its height. As types of these classes, Dr. Kremers takes Doctor Thurnall as an example of the venerable Doctor of Medicine and consulting physician of all the country round, with no pharmaceutical attributes, but a desire to have a pharmacist as a public officer to do the diagnostic work for the physician. John Briggs, the son of a local apothecary, and Tom Thurnall, the doctor's son, are "surgeons, assistants," apprentices or "apothecary's boys" to the local apothecary. The attitude of these two young men behind the prescription counter forecasts the success and failure of their future lives. Kingsley's picture of Dr. Heale, the opium fiend and drunkard, are vivid enough to make any reader see Heale tottering about his boozy "surgery." Dr. Kremers calls attention to Kingsley's fondness for coining names for his medico-pharmaceutical characters such as Dr. Heale, Mr. Bohes, St. Mumpsimus Hospital, Dr.

Bellairs and "Carver, the famous operator." The opium habit and the ease with which habit-forming drugs are obtained are referred to again and again. The store is replete with references and allusions to pharmaceutical practices and *materia medica*, or better, the *materia pharmaceutica*. Many of Kingsley's figures of speech such as "there is a certain medicine called prayer—an old specific for the heartache," have a medico-pharmaceutical basis. All in all, it is an interesting and advantageous book for pharmacists to peruse.—*Am. Drug.*, 67 (1919), 125. (M. D.)

Pharmacy and Medicine of George Eliot.—A. W. Linton recalls some characters in George Eliot's novels and directs attention to her perfection of detail in all that had to do with medical and pharmaceutical subjects as well as in everything else she wrote about. The father and mother of Felix Holt made their living by vending Holt's Cathartic Pills and other remedies and desired that their son should succeed to their business. However his five years of apprenticeship taught him that "ignorance is not as damnable as humbug, but when it prescribes pills it may do more harm." In "Romola" we make the acquaintance of a physician who used gems and precious stones as *materia medica*. In "Middlemarch" one of the leading characters is Lydgate, a young physician. Not only does George Eliot make this man live for us, but her insight into medical life is so accurate that so eminent a surgeon as Sir James Paget found it hard to believe that the character had no biographical foundation.—*J. Am. Pharm. Assoc.*, 8 (1919), 1042. (Z. M. C.)

MISCELLANEOUS.

Association Membership.—*A Wish for 1919.*—E. G. Eberle makes a most earnest plea for a more intense interest on the part of individual pharmacists for co-operation in association work. He also points out that it is to the best interests of both physicians and pharmacists if the membership of their respective national associations have the utmost confidence in each other. Such a spirit has a salutary effect on the public, for after all is said and done it is the great public who will determine whether the practice of medicine and pharmacy is progressing sufficiently to deserve its good-will and confidence. Membership in an association confers on the individual a standing in his community that means much; it identifies the individual as being more or less as-

sociated with the best men in his calling and engaged in efforts to elevate the profession and make it worthy of the confidence of the people at large. It cannot help develop a man, as contact with the best and foremost men of a profession cannot do anything else than stimulate a man to better efforts, and create inspiration for higher ideals. It is by individual and collective effort that pharmacy will receive that recognition that is her due. He points out that the chemists and medical men of our country have grown and made great forward strides largely because they determined that the efforts to bring it about were worth while. Mr. Eberle hopes that pharmacists of this country will put forth the same efforts in an endeavor to make it more effective as an agency of good to those who practice it and of greater service to humanity.—*Am. J. Pharm.*, 91 (1919), 10. (J. K. T.)

Chemical Foundation, Inc.—F. E. Stewart describes the purposes and functions of the Chemical Foundation, Inc., organized by the Alien Property Custodian to lease out German chemical and dye patents.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 277. (R. P. F.)

Chemical Laboratories.—*Ancient.*—In a highly interesting manner, Leo Suppan discusses the development of the chemical laboratory in Europe from its beginnings to its present stage of lavish expenditure.—*Nat. Drug.*, 49 (1919), 385. (C. M. S.)

"Dope" and "Doping."—*Etymology of.*—Xrayser II discusses the use of these two words in their present sense. Dope is from the Dutch *doop*, dipping or sauce, which came rather late in the last century to be used in the United States as a name for any thick or semi-fluid article of food. It does not occur in Bartlett's Dictionary of Americanisms of 1896, but Webster and both the Oxford and Century Dictionaries have it, though without any reference to its slang meaning. This, however, appears in the Concise Oxford Dictionary of 1911, and in Funk and Wagnalls (1913), where its history is thus given: "1, any thick liquid or semi-fluid as an article of food; specifically (1) axle-grease or (2) opium paste; (3) by extension any narcotic drug, as morphine, or a dose for a race-horse intended to influence its speed;" *dopey* is also given below, with the definition, "stupid, as if from opium, dull, heavy;" and *dope-fiend*, defined as "habitual user of a nar-

cotic drug." In Mr. J. Redding Ware's "Passing English" dope is said to have been first used in the States in connection with horses about 1899, and to have been first heard in England in 1900, in which year several horses are said to have died after being "doped." Mr. Ware thinks that the word, in this sense, comes from a proper name, presumably that of the first doper, but this seems unlikely.—Chem. and Drug., 91 (1919), 123.

The Druggist as Notary Public.—Instead of reaching out for more side lines, Emil Roller believes that druggists might take up the work of Notary Public and that it is entirely compatible with their professional standing. Graduates of reputable colleges of pharmacy have had some Commercial Law and Business Practice and are more competent than many people in whom this office is vested. "The druggist as a notary is a public convenience."—J. Am. Pharm. Assoc., 8 (1919), 418. (Z. M. C.)

Federation of American Pharmacy.—H. V. Arny discusses the possibility of a "club rate" for dues providing for joint membership in the A. Ph. A. and State associations.—Proc. N. J. Pharm. Assoc., 49 (1919), 59. (J. H.)

Federation of American Pharmacy.—H. V. Arny makes an appeal for the national federation of American Pharmacy along broad lines. Mutual help and co-operative defense are the principles which must underlie any plan of federation in order to develop federation without entangling alliances. Dr. Arny points out three advantages to be gained by federation: (1) Friendly co-operation between all branches and associations of pharmacy, thereby reducing the fears and jealousies now prevalent between the different pharmaceutical organizations. (2) Mutual defense not only for legislation but also for pharmaceutical research for instance, which is in danger of being handled by others than of a pharmaceutical calling. (3) Publicity—let the public know what the pharmacists can do and thus give credit where credit is due. In concluding, Dr. Arny says it might be advisable to unite these co-operative agencies into closer union, but it is best to bear in mind the adage "make haste slowly."—Drug. Circ., 63 (1919), 130. (M. D.)

Federation of American Pharmacy.—J. H. Beal doubts the feasibility of confederation at this time. In a very instructive article, Dr. Beal first gives a brief historical résumé of the work already started and accomplished toward organization, during which he mentions such well-known men as Prof. Hynson, Dr. John C. Wallace, Prof. Wulling and Dr. A. R. L. Dohme, and some of their work in connection with the subject. Though the National Drug Trade Conference consists of the A. Ph. A., N. A. R. D., N. W. D. A., A. D. M. A., National Association of Boards of Pharmacy and Proprietary Association, has been organized since 1913, it is going strong with ever-repeated good works added to its standard. Dr. Beal fails to see how a big organization made of the many different branches and interests of pharmacy can be found upon a practical basis, wherein Professor, Scientist, Manufacturer, Jobber, Retailer, and others interested in Pharmacy will be satisfied with the Constitution, By-Laws, Voting power, Dues, etc. To use the A. Ph. A. by replacing its various sections with other national organizations, as a starting point, immediately raises the question again of voting power. Dr. Beal is constructive rather than destructive—why go after a new organization when there now exist at least five strong bodies that can and will foster all forward movements of pharmacy? These organizations are all of advantage to any man or men who should try to give to these organizations every bit of his possible moral and financial aid. Let these associations grow and ripen and Dr. Beal says they will affiliate naturally in a short time.—*Drug. Circ.*, 63 (1919), 131. (M. D.)

Federation of American Pharmacy.—Louis Emanuel states that federation of pharmaceutical associations will cause the retail pharmacist to “lose every vestige of his independence and self-respect.” He cites examples of how the pharmacist is daily deprived of preparing and selling medicines, by specialty concerns and manufacturing houses and points out that there is no common interest between those who are actually engaged in the retail drug business and those who are engaged in other phases of pharmacy.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 107. (R. P. F.)

Federation of American Pharmacy.—J. W. England states that Pharmacy needs more unity of effort and suggests closer co-operation between National and State associations.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 104. (R. P. F.)

Federation of American Pharmacy.—M. Soskin shows the urgent need of stronger organization of the American druggist as a whole. The combined efforts of the existing organizations must make every druggist understand that his work and his life may be made easier or harder in direct ratio to his active participation in the organization of his class. Soskin outlines the possibility of so organizing the three present types of existing organizations, *i. e.*, local, state, national; he points out that if the men devoting their time to the existing organizations would make a united effort to organize, the matter could be accomplished readily, as the various organizations could then continue to carry on their own individual work in their respective fields. The yearly meetings or conventions would be held and delegates from local and national associations with specific voting power should attend, while a different plan, applicable to the teaching members, scientific members, etc., of the A. Ph. A. could be worked out. Soskin thinks the time is ripe for action.—*Pract. Drug.*, Aug., 1919, 40.

Hygiene for Pharmacists.—C. B. Lowe dwells on the value of fresh air as an aid to health and a preventative of disease. He advocates hot air heating systems for drug stores in which the air to be heated is drawn from outside the building. He also cautions pharmacists to eat wholesome food slowly and prevent later digestive troubles.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 263. (R. P. F.)

Medicine Remnants.—*Danger in.*—The time-honored family medicine chest, good in its way, has been responsible for many mishaps. Cases are on record where curious children have obtained access to the chest and dosed themselves with potions intended only for adults. Adults having recourse to the chest in the dark have accidentally selected a toxic drug in mistake for the innocuous medicine they were seeking. Should the pharmacist not educate the public to destroy "remnants" when the immediate occasion for the use of the medicine has passed away? Indiscriminate dosing is to be deplored, yet every pharmacist is aware of the extensiveness of the habit. Old prescriptions are treasured like family heirlooms. Medicine is obtained, the patient feels better after a few doses; the bottle goes into the chest; some months later another member of the family imagines he has similar symptoms, and he doses himself with the stale, and probably deteriorated,

remnants. The pharmacist is in a position to emphasize the point that medicine prescribed for one condition is ordinarily not appropriate for other conditions. He can caution the householder to let the medicine chest contain simple remedies only, and encourage the patient to keep fresh medicines by renewing his stock from time to time. Above all, the pharmacist should impress upon the customer the necessity of keeping poisonous mixtures in a separate box. On no account should they be allowed to remain side by side with the simple potions. This policy, if carried out, is good for the patient, and it should be profitable for the pharmacist.—*Australasian J. Pharm.*; through *Drug. Circ.*, 63 (1919), 11.

The National Pharmaceutical Service Association.—G. M. Beringer, at the request of the Executive Committee of the Association, tells how the organization came to exist and reviews its activities. The work must go on until men in the army and navy are assured of as good pharmaceutical service as civilians and until pharmacists in Government service have proper recognition. Prospects for a law embodying the principles of the Edmonds' bill are better than they were. Reorganization of the Medical Department of the Army will receive consideration of Congress and the objections of the former Surgeon-General should no longer hold. The National Pharmaceutical Service Association must continue to be active and should have the support of the body pharmaceutic. In the reorganization laws there must be fair recognition of pharmacy and establishment of a pharmaceutical corps.—*J. Am. Pharm. Assoc.*, 8 (1919), 137. (Z. M. C.)

Paper.—*History of.*—T. J. Keenan describes briefly but interestingly the development of the paper industry from the time of the Egyptian papyrus sheet down to the present day of paper mills in France and Italy. He makes note of the interesting and instructive frieze exhibit at the Swiss Exposition of Paper and Pulp Manufactures, at Berne, 1914, which shows, in successive illustrations, Arabians operating stone pulp mills, Crusaders returning to Europe, carrying specimens of paper and books made in the East, the introduction of the stamp mills, dipping vat and the press, down to that great invention of the continuous paper machine, made by Nicholas L. Robert in 1798. Keenan finds that paper was made in China from the fibrous pulp of plants at least 200 years B. C., but this fact was not known in Europe until 95 A. D. It is interesting to note that about 751 A. D. an Arabian

governor of Samarkand made a sally into Chinese territory and captured many Chinamen. Among these captives were Chinese workmen skilled in the art of papermaking. In order to redeem themselves these slaves worked at their craft, thus giving to the world at large the art of papermaking which originated in China.—Paper Talks; through Am. Drug., 67 (1919), 339. (M. D.)

Private, Secret, Personal.—J. U. Lloyd states that if an apothecary makes a discovery that benefits humanity it is often a duty to utilize it to the financial advantage of his family and himself, and that no law of just ethics can demand that he give such property, without recompense, either to his competitors or to the world at large. Further on in this series of studies he states that teachers in our colleges of pharmacy should be in a position to assure their graduates that merited recognition will be given well-earned personality if they create something or make a useful discovery touching medicine.—Am. J. Pharm., 91 (1919), 202, 341, 419. (J. K. T.)

Pharmaceutical Associations.—*Origin of Some.*—Wilhelm Bode-
mann tells how the Chicago Retail Druggists' Association and the National Association of Retail Druggists came to be organized and also describes the beginning of Illinois Antinarcotic Law and the recognition of the U. S. P. and the N. F. in the first Pure Food and Drug Act.—J. Am. Pharm. Assoc., 8 (1919), 564. (Z. M. C.)

Pharmaceutical Journal.—*New Czecho-Slovakian.*—A new pharmaceutical journal, under the title "Lekarnicky Tydennik," has appeared in Prague. Its program is to promote the interests of Czecho-Slovakian pharmacists, and to further the co-operative movement. Special attention will be paid to trade matters. Chem. and Drug., 91 (1919), 533. (K. S. B.)

Pharmaceutical Journal.—*New Polish.*—A new pharmaceutical journal, under the title "Nowe Czasopismo Aptekarskie," has been issued by the pharmacists of Lwow (Lemberg), the capital of Galicia.—Chem. and Drug., 91 (1919), 859. (K. S. B.)

Pharmacy and Publicity.—E. G. Eberle deplores the lack of proper publicity for pharmacy among laymen. He advocates a campaign of education which will place the pharmacist in the proper light before the public on such questions as the sale of liquors

and narcotics. He also believes that statements derogatory to pharmacy in the public press should be combated through public statements by pharmacists of the true status of affairs.—Proc. Penna. Pharm. Assoc., 42 (1919), 271. (R. P. F.)

Pharmacy.—*As a Hobby.*—Charles H. LaWall calls attention to the tales of adventure, conquest, romance, mystery, superstition and witchcraft, associated even with some of our most common drugs and recounts some of these. He also points out there is much in the every-day practice of pharmacy that remains undiscovered. Success and happiness await the individual who will look upon pharmacy as a hobby as well as the means of earning his daily bread, for he will ride into the by-paths that lead to discovery and exploration of avenues of interest and service yet unknown.—Proc. Penna. Pharm. Assoc., 42 (1919), 168. (R. P. F.)

Pharmacy Workers' Union.—*Organization of.*—Having been registered as a trade union, the Amalgamated Society of Pharmacists, Drug and Chemical Workers, with a membership of 3,000, becomes the first trade union in England devoted solely to workers in the drug trade. The aims of the union include the consolidation of retail, wholesale and manufacturing chemists and druggists into one union; wage regulation; improvement of general working conditions; and exclusion of improperly trained persons from the profession. Arrangements are to be made for a weekly paper dealing with questions affecting employees in the drug and chemical trade.—Chem. and Drug., 91 (1919), 33. (K. S. B.)

Research Institute.—*The Proposed.*—H. V. Arny in a paper read before the Philadelphia Section of the American Chemical Society, after asserting that Dr. Herty's proposition regarding the establishment of an institute of research is desirable, outlines in separate paragraphs under the subjects of *Scope*, *Ideals*, *Management*, and *Final Suggestions* his ideas as to how the plan could be carried out in a practical way. Under "Scope" the author states that it is highly desirable to have a definite statement as to what would be the range of study which the institute would take up. Under "Ideals" he holds that the altruistic nature of the services be emphasized. Under "Management" it is pointed out that it would not be advisable to allow any one association to control the institute. He then suggests that the work should be con-

ducted jointly by the A. C. S., the A. Ph. A., and such national medical associations as may be decided upon and that the work of the institute should from its inception be divided into four departments, namely: (a) chemistry; (b) pharmacy; (c) pharmacology; (d) practical therapeutics.—J. Am. Pharm. Assoc., 8 (1919), 455. (H. H. S.)

Research Institute.—*The Proposed.*—F. E. Stewart gives warning concerning the danger in conducting research unless the products presented are open to competition. The American Chemical Society, who is proposing this Institute, believes in the patenting of medicinal chemicals and a monopolized materia medica means the commercial exploitation of the sick room. America has had enough of product patents and German monopoly of medicinal chemicals. Proper application of our patent law stimulates competition, for the monopoly is limited to seventeen years. Dr. Stewart does not wish to discourage original research, but any plan which will make such research possible must be on an altruistic basis, must not be giving free advertising to anybody's product.—J. Am. Pharm. Assoc., 8 (1919), 256. (Z. M. C.)

Pharmaceutical Research.—*Chemistry's Opportunity in.*—G. D. Beal, in a paper read before the Chicago Branch of the American Pharmaceutical Association, deplores the general tendency to belittle all claims of pharmacy to a place among the scientific professions which has of late been shown in various ways. The author discusses the proposal of Charles H. Herty to raise a fund of \$10,000,000 to provide for a central bureau of research. He points out that no one association representing one of the contributing sciences and not having its major interest in the field as a whole can be expected to offer to the broad-minded administration or direction which such a foundation requires.—J. Am. Pharm. Assoc., 8 (1919), 260. (H. H. S.)

Pharmaceutical Research.—*Development of.*—W. L. Scoville in a paper before the Chicago Branch of the A. Ph. A. makes a plea for the development of research in pharmacy. He points out the need of research laboratories and expresses the opinion that no such research laboratory should be given final power of decision over such things as the U. S. P. and N. F. problems. He believes that there should be several research laboratories as even in re-

search the stimulus of rivalry and opposition is needed to secure fairness.—J. Am. Pharm. Assoc., 8 (1919), 267. (H. H. S.)

Life at Ruhleben.—In a lecture given before the Progressive Pharmacy Club, G. P. Forrester described his four years in the prison camp at Ruhleben, Germany, where he was interned as an alien enemy.—Chem. and Drug., 91 (1919), 345.

Scientific Movement of Peoples.—Major Landa, Pharmaceutical Corps, Spanish Army, thinks that the war, despite its horrors of desolation, ruin, death and privations, to all nations, has stimulated ingenuity and progressiveness to a far greater degree than twenty years of peaceful work have done. He cites two instances as examples: First, the establishment of an International Council of Research at Brussels, where Allied and Neutral Countries may be represented for the purpose of co-ordinating the different branches of science and their applications to promote the creation of international unions that may be deemed useful for the furthering of science and the proper orientation of international scientific activities. Spain sent to this Council prominent engineers and university professors as a commission representing her War, Public Works, and Public Instruction Ministries. Second, The recent fall meeting of the Spanish Society for the Advancement of Science held at Bilbao, at which meeting many new and progressive inventions were examined and studied by all scientists present. It is evident that all countries are rapidly approaching the stage of a more perfect organization of the individual initiatives in continuous research for science to play a bigger part in economic development and readjustment of the world at large.—Am. Drug., 67 (1919), 463. (M. D.)

Sections in Pharmacy.—J. U. Lloyd makes public a section of the first volume of a treatise entitled "A Study in Pharmacy," written by him in 1894 at the request of Dr. Charles Rice, and which was presented in fascicles privately to a limited circle of the author's friends. The various definitions of the term "pharmacist" are quoted from the different dictionaries, modern as well as antiquated, and the limitations of these definitions are discussed. A description of "The True Pharmacist" is given. J. Am. Pharm. Assoc., 8 (1919), 358. (H. H. S.)

Single Tax.—S. W. Williams, under the title "The Remedy," quotes from various authors who believe that the adoption of Single Tax would remedy many of the ills caused by unjust taxation. He asks that druggists investigate for themselves and directs attention to several books: "The Old Freedom," by Francis Neilson; "The Next Step toward Democracy," by Emil O. Jorgensen; "The Taxation of Land Values," by Louis F. Post; Charles G. Merrell's article "Untaxing Industry." *J. Am. Pharm. Assoc.*, 8, 1919, 631 should be read by every druggist.—*J. Am. Pharm. Assoc.*, 8 (1919), 1047. (Z. M. C.)

A Social Service.—E. Fullerton Cook reviews the work of the Government in its campaign to control venereal diseases and points out how the pharmacist can take an active part in co-operating with the Government in this work on an altruistic basis.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 157. (R. P. F.)

Trade Unionism in Pharmacy.—J. H. Rehfuß shows how a few restless, dissatisfied, complaining drug clerks tried to pull pharmacy from its professional pedestal, to make it an industry on a plane with mining, carpentering, and other callings which are in no way professions. Since the licensed pharmacist must be an all-round man to fit in where and when needed, because prescription work does not go on continuously but rather spasmodically, labor unionism would never fit in pharmacy because the union would eventually see to it that a special clerk would be placed in each department—a possibility only in the large stores. Rehfuß cannot conceive of a right-minded pharmacist going on a sympathy strike with affiliated unions, knowing he is as responsible for the public health as the physician. The man to man attitude now playing a big part in the daily life of the progressive far-seeing proprietors and their drug clerks is the sure safe way to keep harmful labor unionism out of pharmacy and the only way to make careful, honest, energetic drug clerks, thinks Mr. Rehfuß, who also suggests that all druggists form an association of their own, then become an active auxiliary to their state and national associations.—*Drug. Circ.*, 63 (1919), 544. (M. D.)

Year Book or an Abstract Journal.—J. W. England discusses a plan which would be both modern and business-like in regard to the publication of features of the American Pharmaceutical Association. Suggestions are made whereby a grading subscription,

each member would get only what he wanted and was willing to pay for and the Association would get what it in turn pays for the service it renders to its members. In other words, the essence of the plan is an entire revision of its system of membership, so that the dues shall be graded by the cost of the service rendered to each member.—*Am. J. Pharm.*, 91 (1919), 784. (I. G.)

B—APPARATUS AND MANIPULATIONS

Boiling.—*Use of Coal in Hastening.*—E. C. Kendall in searching for some substance to substitute for talcum to cause a rapid boiling of a solution, tried pumice stone, powdered brick, broken glass, glass beads, granite, etc., and found them unsuitable. He therefore suggests the use of anthracite coal as the formation of bubbles does not take place on the sharp edges and corners alone but also over the hard, smooth surfaces of the coal minute bubbles form with great rapidity, and under some conditions a piece of coal of 2 mils volume can be raised from the bottom of the flask by the rapid formation of bubbles on its surface. Coal is equally successful in preventing pumping in Kjeldahl flasks and in the distillation of organic liquids. If the coal is kept under water indefinitely it becomes less active, but heating in an oven will restore its activity.—*J. Am. Chem. Soc.*, 41 (1919), 1189. (J. L. M.)

Carbonates.—*Apparatus for Assay of.*—A. Craig has devised the apparatus shown below. The generator is made of a test tube shortened to a convenient length. The pipette bulb may be made by blowing out a piece of thick-walled tubing to a capacity of about 2 mils. The tube *A* extends below the stopper just far enough to connect a rubber tube. The tube *B* is made long enough to dip into a small beaker for filling. *B* and the pipette are connected by a rubber tube and pinch-cock. *C* is continued in one piece, bent across and down, and stoppered into the top of a 50-mil burette, so that the generator hangs from it. To fill the pipette, attach a rubber tube to *A* and suck the acid (concentrated HCl) up through *B*. As a standard, weigh 0.2 gramme of ignited sodium carbonate into the dry test-tube. Fill a second open burette (connected with the closed one) with water, raise until the water rises to the zero of the closed burette, leaving enough in the open burette for leveling. Close the stop-cock of one of the burettes, return the open burette to its stand, connect the gen-

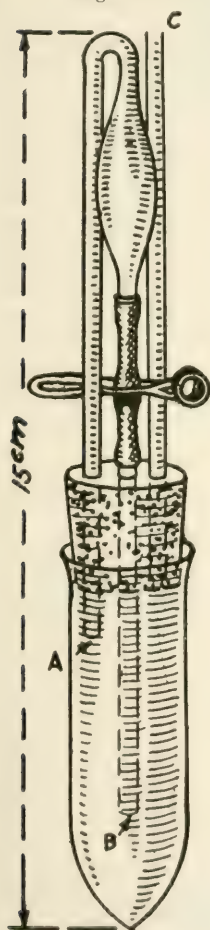
erator, level, and read the burette, avoiding any warming of the inclosed air. Then open the pinch-cock, allowing the acid to fall dropwise until action ceases. Shake the generator to make sure that the acid has reached all the carbonate, then level the burette

Fig. 1.

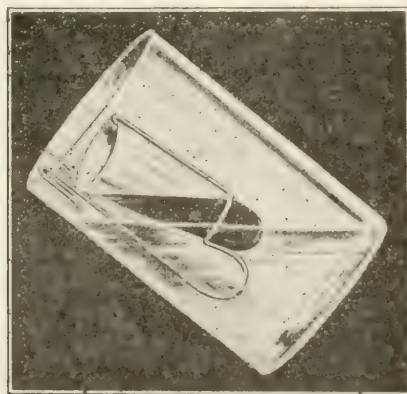
and read it, taking the increase in volume as carbon dioxide. Then make the tests at once, without allowing the temperature of the room to change. Greater accuracy may be obtained, particularly when caustic alkalies are tested, if the generator is immersed in water at room temperature during the reaction and the reading of the burette. The result is calculated as follows: $0.0830 \div \text{mils of standard reading} \times \text{mils of test reading} = \text{grammes CO}_2 \text{ in test.}$ —Eng. Mining J.; through Chem. Abstracts, 13 (1919), 1437.

Deglutitory Cup.—This is an arrangement whereby it is possible to swallow medicines without experiencing any disagreeable taste. A small

Fig. 2.



Carbonator.



Deglutitory Cup.

cup is provided which is held in a wire clip that may be attached to the rim of a tumbler in the manner shown in the accompanying illustration. The tumbler is first partly filled with water and then the cup with the medicine in it is fitted to the tumbler. The patient merely drinks the water in the glass and at the same time the medicine flows out and, floating on the film of water, is kept

Fig. 3.



Dosage Cup.

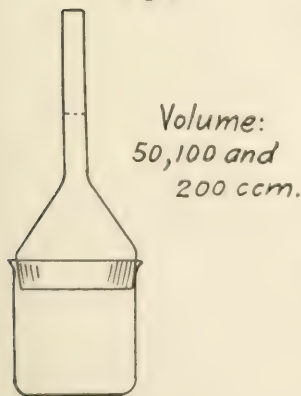
from coming into contact with the tongue. Not only liquid medicines, but capsules, pills and powders can be taken in this way. —Sci. Am.; through J. Am. Pharm. Assoc., 8 (1919), 382.

Dosage Measure.—*Standard.*—G. M. Beringer suggests that a description of a "suitable medicine measure" be included in the forthcoming revision of the U. S. P. and proposes a glass in the shape of an inverted cone with large, broad, flat, round base with short, heavy stem (Fig. 3). Said glass to be graduated in three distinct columns, 5, 10, 15, 20, 30, 45, 60 minims; the teaspoonful and the one-quarter, one-half, and three-quarter fractions thereof; the dessertspoonful; the tablespoonful; and the wineglassful along with their equivalents in mls. Each graduation is said to be distinct and accurate for even 5 minims.—Proc. N. J. Pharm. Assoc., 29 (1919), 55. (J. H.)

Drug Density.—*Apparatus for Determining.*—H. Kunz-Krause

applies the principle of the pycnometer determination of powdered drugs in the apparatus shown herewith, which consists of a beakerlike container, into which is ground a funnel-shaped glass cover (Fig. 4), the filling fluid being liquid petroleum. The article gives results when the apparatus was used with powdered metals, calcium fluoride, juniper, flaxseed and guaiac resin.—Ber. pharm. Ges.; through Chem. Abstracts, 13 (1919), 2414.

Fig. 4.

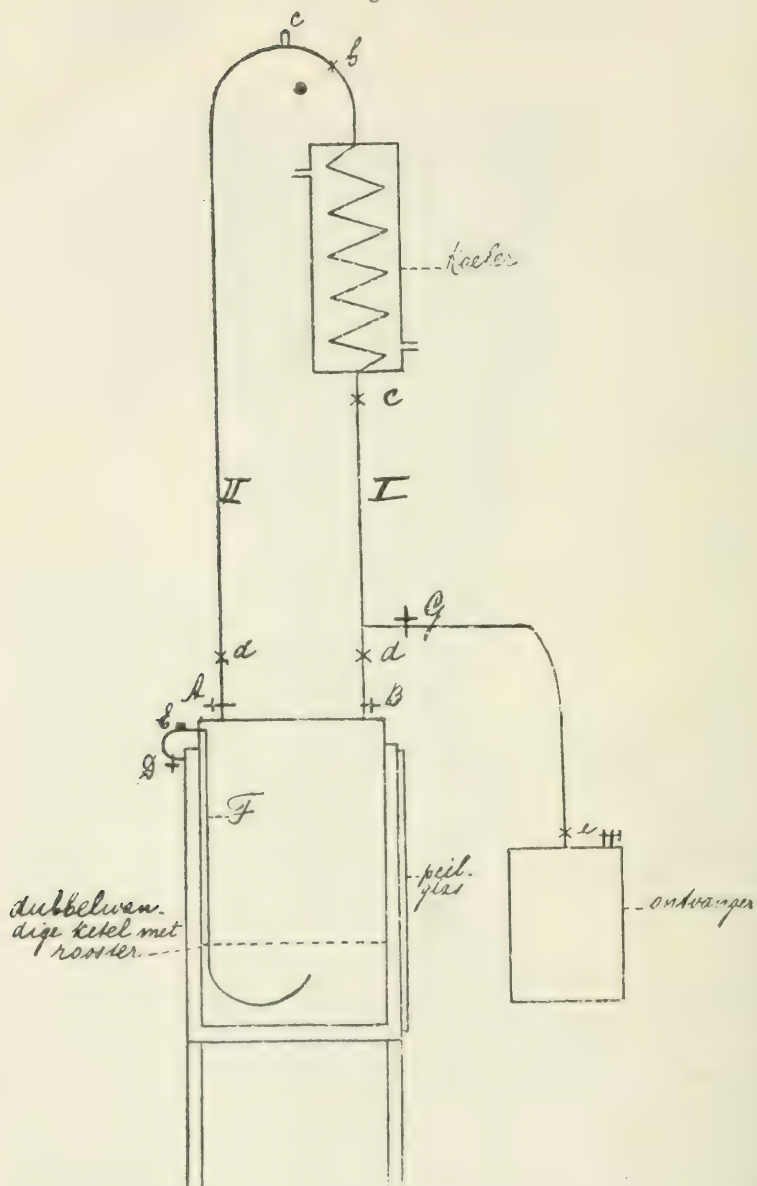


Drug Density.

Egg Albumen.—*Apparatus for Disintegrating.*—George Èwe describes a mechanical disintegrating device for egg

albumen which is to overcome the difficulty of preparing the albumen for the U. S. P. assay process. The apparatus is built on the principle of a screw press. The albumen is placed on a brass disc which is perforated like a No. 40 sieve; another plain brass disc covers the albumen and the turning of the screw press forces the albumen through the sieve.—Proc. Penna. Pharm. Assoc., 42 (1919), 173. (R. P. F.)

Fig. 5.



Extraction Apparatus.

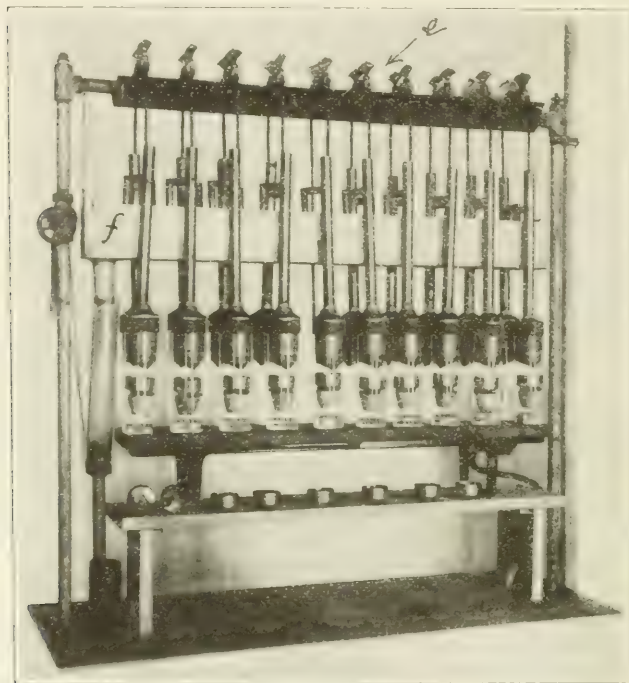
Extraction Apparatus.—A very simple apparatus for distilling and extracting purposes, for stabilizing drugs with alcohol vapors, for making aromatic waters, etc., has been devised by H. W. Van Urk. The apparatus consists of a tin-lined copper kettle, 25 cm. wide and 40 cm. high which is provided with a jacket 2 cm. wide. From the inside of the jacket a tube, *F*, provided with a stop-cock, *D*, and a safety valve, *E*, leads to the inside of the kettle. The jacket is further provided with a water-gauge. From the cover of the kettle, which is fastened on it by means of four screws, two tubes with stop-cocks *A* and *B* can be connected with a condenser. A stop-cock, *G*, is inserted into the tube leading to the receiver. The operating of the apparatus is very simple. When a drug is to be extracted it is placed on the perforated diaphragm which is inside of the kettle 10 cm. from the bottom, the jacket is filled with the extraction liquid and after having opened stop-cocks *D*, *A* and *B*, the liquid is heated. A continuous extraction takes place. When it is finished, *D* and *B* are closed and the safety valve *E* and stop-cock *G* are opened, the extraction liquid on further heating of the apparatus distilling into the receiver. When a drug is to be digested with alcohol, stop-cocks *A* and *G* are closed, stop-cock *B* and safety-valve *C* are opened, the apparatus heated and when the digestion is finished stop-cocks *G* and *A* are opened, stop-cock *B* and safety-valve *C* are closed in order to distil the menstruum.—Pharm. Weekblad, 56 (1919), 1301. (H. E.)

Evaporation Apparatus.—*Rapid.*—Merrill and Ewing describe a simple apparatus for accelerating the evaporation of liquids. The air from the blast is first filtered through cotton, and then passed through a 2 meter coil of 0.6 cm. copper tubing which rests on the steam pipes in an ordinary steam bath. The heated air issuing from the coil is conducted through individual blowers, supported over the respective holes of the steam bath. By means of glass stop-cocks, the volume of heated air is regulated and allowed to impinge on the surface of the liquid to be evaporated. By this means the time of evaporation of liquids is greatly reduced and at a lower temperature than by direct heat.—J. Ind. Eng. Chem., 11 (1919), 230. (L. A. B.)

Fat Extraction Apparatus.—J. M. Pickel describes an apparatus (Fig. 6) for making fat extractions, for which he claims the advantages of greater compactness and greater economy in operation

than other forms of extraction apparatus. The ether is recovered without interruption of the distillation and no time or ether lost in taking the apparatus apart to remove the substances extracted.—J. Ind. Eng. Chem., 11 (1919), 1053. (L. A. B.)

Fig. 6.



Fat Extraction Apparatus.

Funnel.—*Efficient Laboratory.*—T. B. Aldrich describes a funnel for filtering liquids, especially by forced filtration and which he claims prevents the formation of channels and passages and allows more rapid filtration. The funnel is made of aluminum and consists essentially of four parts: a cast hollow cylinder with a flange at the bottom, a perforated plate, a cone-shaped lower portion with a threaded flange at the top, and a ring or band so threaded that the several parts can be firmly clamped together.

In preparing the funnel for filtering, the filter paper is placed on the perforated plate and the plate clamped between the upper and lower part of the funnel by means of the threaded ring.—J. Ind. Eng. Chem., 11 (1919), 139. (L. A. B.)

Fusion Bomb.—*For Sulphur Assays.*—S. W. Parr describes a fusion bomb for the oxidation of sulphur in coal, rubber, and other organic combinations, the determination of carbonaceous matter in soils and as a substitute for the Carius method of determining halogens in organic compounds. This apparatus consists of a fusion cup, and a cover held in place by a screw cap, the charge consisting of 0.5 gramme coal with 9 or 10 grammes of sodium peroxide, which after being sealed within the holder is thoroughly mixed by shaking. The charge is ignited by holding the bottom of the cup for a moment in the flame of a Meker burner, after the ignition, the bomb is cooled and the charge dissolved out.—J. Ind. Eng. Chem., 11 (1919), 230. (L. A. B.)

Glass for Poison Analysis.—F. Klein describes a simple apparatus devised by him for the detection of volatile poisons.—Pract. Drug., Apr., 1919, 23. (F. H.)

Guttameter.—Eschbaum describes a specially constructed capillary pipette from which 10 drops are collected in a weighing bottle. The weight corrected by the factor of standardization (using the instrument with water at 20°) is proportioned to the surface tension. Eschbaum confirms the general relation between surface tension and toxicity, based previously on studies with the stalagmometer.

Arranging his solutions in the order of decrease in surface tension, Eschbaum observed increased toxicity.—Ber. dtsch. pharm. Ges.; through J. Chem. Soc. Abs., 116 (1919), 139. (A. V.)

K-P. Clip.—*Use of.*—This appliance devised by G. A. Keane and G. Patchin is a practical device for securing connection between rubber tubing and glass or metal tubing. The accompanying illustrations (p. 58) show a small clip (Fig. 7), one with a sleeve (Fig. 8) and the two combined on a filter pump (Fig. 9).—J. Soc. Chem. Ind., 38 (1919), 391T. (K. S. B.)

Laboratory Ware.—*Standardization of Sizes of.*—The German Chemical Society has appointed a commission whose duty will be to elaborate the bases for the standardization of the sizes of all laboratory apparatus.—Chem. and Drug., 91 (1919), 1021. (K. S. B.)



Fig. 7.

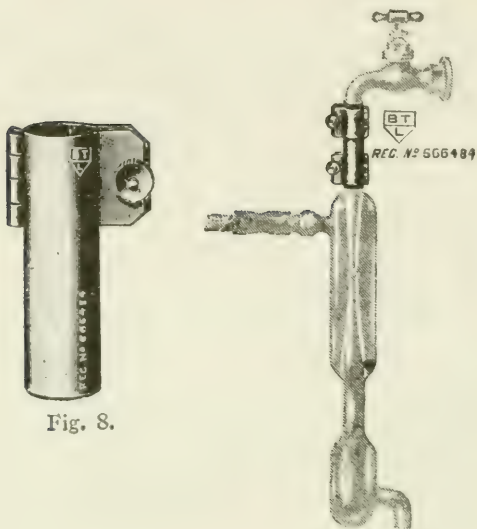


Fig. 8.

Fig. 9.

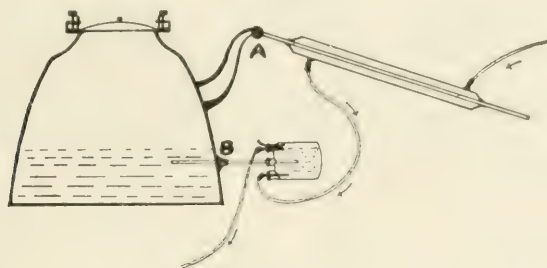
Molecular Weight Apparatus.—*An Isotonic.*—P. Blackman claims to have obtained very accurate results by use of his apparatus for comparing molecular weights. A tubular, porous, unglazed cell is treated with copper sulphate and ferricyanide solution, and then with paraffin. This cell is filled with the solution, and placed in a large test-tube also filled with solution. After a time, the volumes of both solutions are measured.—*Chem. and Drug.*, 91 (1919), 599. (K. S. B.)

Rubber Stoppers.—*Restoring.*—A foreign technical journal gives the following simple method for rendering hard perished rubber stoppers again serviceable for use. If the rubber stopper is not entirely perished, it can be restored to a usable condition by turning off the hardened external portion in a lathe, the turned surface being finally smoothed with sand paper. The softer the stopper, the greater must be the speed of rotation of the lathe. The hard-

ened surface of a boring in the rubber stopper is similarly removed by means of a round file, the stopper being rotated in a lathe.—*Pharm. Era*, 52_(1919), 314.

Still.—*Simple Aluminum.*—T. O. Smith suggests the use of an aluminum kettle for distilling water in such cases where the presence of traces of aluminum are not objectionable. The illustration

Fig. 10.



Still.

(Fig. 10) shows the apparatus, the joints at A and B being made water-tight by wrapping with cotton yarn.—*Chem. Analyst*; through *Chem. Abstracts*, 13 (1919), 3041.

Thermometers.—*Misleading Certificates for Clinical.*—Director Stratton of the United States Bureau of Standards reports that clinical thermometers are regularly being sold with certificates of accuracy issued by manufacturers and dealers which either by direct statement or indirectly by skilful wording lead the purchaser to believe that the thermometers have been tested or certified by the United States Government. He furnishes facsimiles of the certificates used by his bureau and of the other kinds. He says: "The Bureau of Standards has not taken the position that manufacturers should not issue certificates for thermometers, provided the certificates are the result of careful testing, are not deceptively worded, and bear the manufacturer's name. There are reliable manufacturers turning out high grade instruments who issue their own certificates.—*J. Am. Med. Assoc.*; through *Drug Circ.*, 63 (1919), 175.

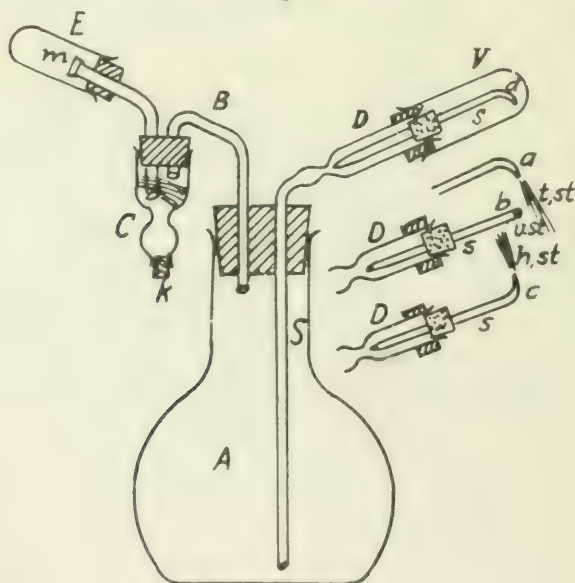
Thermometers.—*Testing in France.*—Official verification and control of clinical thermometers were rendered compulsory by the act of August 14, 1918. The decree, fixing the conditions under

which the law will be put into force, was published in the *Journal Officiel* on March 5. It is a very lengthy one. Some of the points are: The external surface for thermometers graduated on the stem, to be prismatic (lens-fronted); "minute" thermometers to indicate, in twenty seconds, the temperature of a vessel of water that has been stirred; approved thermometers to be marked with the official stamp of verification, the registration number of the depot and the date.

A fee of 25 centimes is due for the first examination; of 60 centimes for verification of accuracy, and, in addition, a fixed fee of 1 franc for every thermometer, or every lot of instruments, whatever the number presented. These fees are repaid, with the exception of the last one, on clinicals for export.—Chem. and Drug.; through Drug. Circ., 63 (1919), 225.

Wash Bottle.—*For Sterile Distilled Water.*—A. Gawalowski suggests the following appliance for bacteriological work. The inlet or "blowing" tube (Fig. 11) *B* has an inset, *C*, containing

Fig. 11.



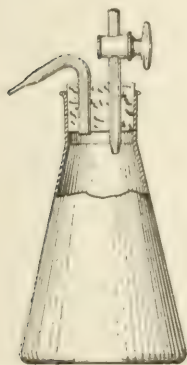
Wash Bottle.

curly glass wool, and ends in the mouthpiece *m*, which may be covered with the tube *E*. The tube *S* is first narrowed and then

enlarged as shown at *D*; holds a soft paraffined cork carrying the outlet tube *s*; *a*, *b* and *c* show the tip *d* so turned as to give a downward, lateral, or upward jet. When not in use, *s* is protected by the tube *V*. The lower portion (bulb) of *C* serves to trap any moisture from the breath; this can be removed at *k*. To sterilize a liquid in *A* by heat, remove *C* and *V*; after sterilization, attach *C*, then when vapor ceases to emerge at *s-d*, attach *V*. After *A* cools, attach *E*.—Z. anal. Chem.; through Chem. Abstracts, 13 (1919), 1870.

Weighing Burette.—*Simple.*—D. W. MacArdle has devised a simple weighing burette which obviates all corrections and allows nearly as rapid work as the ordinary style, with accuracy limited only by the sensitiveness of the end-point.

Fig. 12.



Weighing Burette.

The sketch is practically self-explanatory. The glass stop-cock was taken from a broken burette. To use the burette, turn up the cock closed, so that the capillary is over the titrating vessel, and allow the heat of the hand to force the standard solution into the capillary. Then when the cock is opened the liquid will flow freely, and there will be no danger of loss through the cock. When near the end-point, the cock may be closed and the solution forced in drops by the heat of the hand.

A predetermined quantity of solution cannot be delivered without repeated weighings, but a little practice will enable the user to estimate the desired quantity within a few per cent.—J. Ind. Eng. Chem., 11 (1919), 670.

STERILIZATION.

Alkaloids.—*Changes during Sterilization.*—F. Zoccola states that neutral aqueous solutions of morphine hydrochloride remain unaffected by sterilization. In presence of small amounts of alkali, a precipitation of the base and a yellow coloration is noted. This same result was noted when the sterilizing process was carried on in vessels of alkaline glass. A yellow color also was noted in solutions containing 0.50 per cent. of hydrochloric acid. In solutions containing 25 per cent. of the acid, a decided greenish yellow

color results, and the presence of apomorphine was demonstrated. In case of solutions of apomorphine, the author states that these must in every instance be freshly made, using boiled, distilled water, and must be subsequently stored in absolutely neutral glass containers. Perfectly neutral solutions of cocaine hydrochloride, when heated to 100° undergo hydrolysis. The degree of hydrolysis is, however, very limited, if the sterilization is carried on in neutral vessels. On this account this method of sterilizing is preferable to the addition of phenol or other preservatives. The author states that the presence of even minute amounts of alkali will cause hydrolysis in cocaine solutions, even in the cold, while on heating as much as 50 per cent. of the alkaloid is converted into ecgonin and benzoic acid.—Gior. Farm. Chim.; through J. Soc. Chem. Ind., 38 (1919), 512A. (G. C. D.)

Catgut.—*Sterility of.*—Butterfield and Ely found out of 15,000 tubes (representing the output of five million) 11 per cent. were contaminated. After describing their method for testing in detail, the authors conclude: "When oil is used as an immersion fluid for the catgut, washing before planting should not be carried out if a fair check is desired on the sterility of the catgut. The suture should be taken from the tube for bacteriologic examination according to the methods commonly practiced among physicians when they have occasion to use catgut. Chromicized catgut is slightly more resistant to sterilization by heat than the plain variety. The infection that is found is either within or on the catgut itself and is not present in the immersion oil alone. From 28 to 30 pounds' pressure of live steam for three hours is absolutely necessary to sterilize the samples tested. Since any contamination may be pathogenic or otherwise it is recommended that some system of federal control should be devised similar to that for biologic products, so that all firms manufacturing catgut could be required to adhere to the same standard of sterility.—J. Am. Med. Assoc., 72 (1919), 1736.

Di-Sodium Methylarsenate Ampuls.—*Sterilization of.*—George Éwe says that it is necessary to allow solutions of di-sodium methylarsenate in distilled water to stand for at least 24 hours before filling into ampuls since a small quantity of precipitate forms in that time. This solution cannot be sterilized at 10 lbs. steam pressure on account of the precipitation but sterilization

at 100° C. for one-half hour on three consecutive days shows no noticeable change in the solution.—Proc. Penna. Pharm. Assoc., 42 (1919), 177. (R. P. F.)

Sodium Bicarbonate Solution.—*Sterilization of.*—E. J. Hart tried different methods of sterilizing 5 per cent. solution of sodium bicarbonate. He finds that sterilization for 20 minutes in a Koch steam sterilizer is the most satisfactory method, only 0.47 per cent. of sodium carbonate being present in the solution after complete sterilization.—Pharm J., 102 (1919), 159. (C. P. W.)

Solutions.—*Stability in Ampuls.*—A. Heffter assayed the sterile contents of ampuls by pharmacological methods, since the amount of medicament in each was too small to permit chemical assay. Of the samples examined no deterioration was noted in 10 months, and in the case of strophanthin solutions, their activity was found unimpaired after 13 months.—Ber. pharm. Ges.; through Chem. Abstracts, 13 (1919), 2413.

Hypodermic Solutions.—*Sterilization of.*—A solution of quinine hydrochloride may be sterilized in an autoclave at 115° C. for fifteen to twenty minutes. A solution of emetine hydrochloride is sterilizable at 100°; solutions of strychnine hydrochloride, cocaine hydrochloride, and morphine tartrate are similarly sterilized at 115° for 15 to 20 minutes.—Pharm. J.; through Pract. Drug., Dec. 1919, 37.

CONTAINERS.

Glass.—*History of.*—W. W. Figgis states that the discovery of glass was probably due to chance and is attributed to Tubal-Cain, who was born 3870 B. C. It is said that while preparing their repast near the mouth of the River Belus in Palestine, he and those with him were unable to find stones upon which to place their pots so they utilized cakes of nitre for the purpose. The heat of the fire upon the nitre and the sand of the shore produced glass. Its history continues to be just as interesting in the succeeding centuries.

The first enterprise for the manufacture of glass in America was in Virginia shortly after the founding of Jamestown.

A novel explanation of the druggists' show globe is the story that it was an honor granted to apothecaries by Julius Cæsar

because one consented to have lanterns placed behind some large bottles in his window. In these bottles drugs were macerating and they colored the liquid. The colored light guided Cæsar's troops when they landed on the coast of Ireland in the darkness of night.—J. Am. Pharm. Assoc., 8 (1919), 419. (Z. M. C.)

Glass Containers.—*Adsorption of Metals by.*—Some years ago K. Scheringa noticed that the amount of lead present in a drinking water kept in a glass container, had decreased considerably on standing, which led him to the conclusion that the lead had been adsorbed by the glass. A similar phenomenon can be noticed when a glass container is filled with a solution of an aniline dye. On emptying the container the dye adheres to the glass and cannot be removed by simple washing. But this adsorption is only apparent. When the container is carefully cleaned with soap, rinsed several times with boiling water and filled with an aniline dye solution while still wet, the dye will not adhere to the walls. In containers thus cleaned and filled separately with solutions of 10 mgms. of lead acetate in one liter, 5 mgms. of copper sulphate in one liter and 10 mgms. of zinc sulphate in one liter, no loss in metal was noticed after two days; the loss after four days was negligible. A study for a longer period was not made because the carbonic acid of the air or microorganisms precipitate some of the metal. This probably accounts for the loss previously noticed.—Pharm. Weekblad, 56 (1919), 8.

Glass Stoppers.—*How to Loosen.*—In cases where stoppers cannot be loosened by knocking, heating, etc., Schwarze recommends bringing the stopper in contact with hydrogen dioxide solution for some time. Small apparatus are placed into the dioxide solution, while bottles are placed upside down into the liquid. In the case of burettes the stop-cock is placed into the solution and the burette partly filled with it.—Muench. med. Wochensch.; through Pharm. Weekblad, 56 (1919), 261. (H. E.)

Glass Vessels.—*Permanent Marking of.*—J. C. Bock proposes for the use of glass color fused in the glass by means of an ordinary burner for marking glass vessels permanently. In order to apply the colors (the numbers refer to R. & H. products) they are intimately mixed with a vehicle made up of 4 parts of copaiba balsam, 1 part clove oil, 1 part lavender oil, with one of the colors Green 72SD, Blue 1079D, and a mixture of Brown 695D and

White Enamel 1310D. The Brown alone can only be used on hard glass or porcelain where higher temperatures can be applied. The glass color in powdered form is mixed with just enough of the oil, so that it will run from a steel pen, with which it is applied to the surface of the glass or porcelain. The mark is then dried by holding above the flame, and when dry the marked place is held against the side of a Meker burner, when after blackening through carbonization of the oils the mark will begin to glow a dull red. At this point the article is removed, allowed to cool a little and reheated until the markings, not the glass, again begin to glow. The marking so obtained presents a smooth, shiny surface, and cannot be removed by mechanical or the usual chemical means. The method has been successfully employed for graduating test-tubes for special work, marking Kjeldahl flasks, beakers and distilling flasks.—J. Am. Chem. Soc., 41 (1919), 359.

Glassware.—*Testing.*—Kroeber suggests the inclusion of tests for glassware in the next German Pharmacopœia. The following rough test for soluble alkali is suggested: Place 100 mls of water in the vessel to be tested, add two to three drops of alcoholic phenolphthalein solution, and set aside for one hour. The solution should not show more than a bluish rose color, and should not require over two to three drops of *N* 10 hydrochloric acid solution to decolorize it. As a more sensitive test the following is advocated: The vessel to be tested is filled with a 0.1 per cent. solution of narcotic hydrochloride and set aside at room temperature; medicine bottles should give no precipitate, or, at most, traces only of flocculent precipitate within a quarter of an hour. Ampuls and measuring apparatus should not show more than traces of a flocculent precipitate in half an hour, and the precipitate should not increase at the end of a further half-hour.—Pharm. Zent.; through Chem. and Drug., 91 (1919), 115.

MISCELLANEOUS.

Air in Submarines.—In order to purify the air in submarines the Germans use washing columns and potassium hydroxide cartridges, while the French use sodium peroxide. The former method is claimed to be superior to the latter. M. Wagenaar reports that the carbonic acid in a submarine of 100 cubic meters contents and manned with 11 persons reaches the danger point, 3 per cent.,

about five hours after submerging. In order to find this danger point several methods are used, one depending on determining the point where barium hydroxide no longer decolorizes phenolphthalein solution. For this purpose a piece of cloth is impregnated with phenolphthalein solution and dried. A drop of $N/100$ barium hydroxide solution is then placed on the cloth and when this is decolorized within 2.5 minutes, the air contains 3 per cent. of carbonic acid and the air purifying apparatus should be applied. A very simple apparatus for estimating the carbonic acid, named *acronom*, has been devised in Holland. The apparatus depends on the absorption of carbonic acid by caustic soda, by which a reduction of pressure is produced which is indicated in parts per 1000 on a manometer.—Pharm. Weekblad, 56 (1919), 1001. (H. E.)

Catgut.—*Action of Bacteria and Antiseptics on.*—Taylor reports that catgut ligatures in a wound may disintegrate and secondary hemorrhage follow when the wound contains *B. ærogenes capsulatus welchii*. No other bacterium appears to attack the catgut, and none of the antiseptics modifies its elasticity or strength, but under the influence of hypochlorite solution the surgical knot becomes untied. Hence he warns against the use of Carrel's solution for a wound in which an important vessel has been ligated, especially in the presence of *B. ærogenes capsulatus*.—Arch. med. Pharm. Milit.; through Chem. and Drug., 91 (1919), 483.

Celluloid Solution.—*For Adhesive Traction.*—W. F. Cunningham reports that many of the disadvantages of Sinclair's glue may be avoided by the substitution of a solution of celluloid in acetone containing from 5 to 10 per cent. of celluloid.—J. Am. Med. Assoc., 73 (1919), 976. (W. A. P.)

Crystals.—*Growing Perfect.*—R. M. Moore having occasion to procure large, clear Rochelle salt crystals in an investigation of some of the electric properties of crystals, found it impractical to obtain these from commercial sources, a search through tons of crystals yielding only one or two pounds of suitable material, it became necessary to work out some method of producing the material in the laboratory. The method adopted consists in making a saturated solution at some convenient temperature usually between 35 and 40°. The solution is removed from the excess of salt, heated to a temperature of about 7–8° above the saturation

temperature and filtered through paper on a Buchner funnel. The temperature of the solution is not allowed to fall to less than 4.5° above its saturation temperature. Small seed crystals are placed in a jar and the salt solution then poured in. The jar is covered at once with a glass plate and placed in a large water-bath, the temperature of which is about 0.5° above the saturation temperature of the solution. The temperature of the whole is allowed to fall off to practically the saturation temperature as fast as the bath tends to cool. Then by means of a sensitive thermostat, the rate of cooling is controlled and the temperature allowed to drop at the rate of about 0.1° per day, until the crystals have increased noticeably in size and have built out into perfect crystals. This usually takes about one day after the saturation temperature is reached. Then the temperature is allowed to fall about 0.2° per day; after the crystals are about $\frac{3}{4}$ to 1 inch long the rate of cooling is increased to 0.3° to 0.4° per day, and when the crystals are well over one inch, to 0.5 – 0.6° per day. The thermostat setting is changed twice each day—morning and evening. When the solution is cooled to about room temperature the jar is removed from the bath and the crystals taken out. They are dried by wiping with a soft, dry cloth.—J. Am. Chem. Soc., 41 (1919), 1060. (J. L. M.)

Flavoring Extracts.—*Non-Alcoholic.*—Azor Thurston points out that most flavoring extracts are simple solutions of volatile oils in alcohol. In making non-alcoholic flavoring extracts he finds that volatile oils are soluble or miscible in the fixed vegetable and animal oils—such as cottonseed, olive and neutral lard oil—which are much cheaper than alcohol, and at the same time hold the aroma of the oils much longer than does alcohol. Indeed, small portions of fixed oils are added to commercial stocks of volatile oils to prevent oxidation. Extract of vanilla does not conform to the general type of flavors in that it is not a solution of a volatile oil in alcohol. He has therefore worked out the following formula, which has proven satisfactory:

Vanilla or tonka beans finely powdered.....	10 grammes
Vegetable (fixed) or animal oil.....	1000 grammes

Add the finely powdered vanilla or tonka beans to the oil and heat on a water-bath for 30 minutes to 70 or 80° , agitating from time to time while heating. Cool and strain through a felt oil strainer. Care should be taken not to heat

above the temperature mentioned or some of the aroma will be lost. If not heated the vanillin or coumarin will not go into solution in the oil, or very slowly.

Artificial vanillin and coumarin must be treated the same way and will remain in solution up to 2 to 2.5 per cent., which is ten times as much of the substances as would exist in extracts prepared from the beans. In use the same amounts will be taken as for the alcoholic extracts. Attention, however, is called to the fact that the oil flavors do not have an odor in proportion to their strength. Soda fountain operators serving cheap sodas would probably object to these oil flavors because of their immiscibility with water, but dealers serving high grade sodas use the natural fruit juices and syrups. The author suggests that the enactment of a law requiring non-alcoholic flavoring extracts would stimulate manufacturers to research along this line that would perfect the non-alcoholic product.—*Midland Drug.*, 53 (1919), 88. (A. G. B.)

Flavoring Extracts. *Non-Alcoholic.*—F. M. Boyles states that non-alcoholic flavors as they are known are not as satisfactory or as efficient as the alcoholic extracts. The non-alcoholic extract may be divided into (1) Solutions of the essential oil in fixed oil such as cottonseed or peanut oil, (2) Emulsions of the essential oil by means of a gum and water, (3) Intimate mixtures of a terpeneless oil with syrup or invert sugar. The author discusses the limitations of their use, the difficulties encountered in the manufacture when such extracts are to be incorporated and mixed with other substances. As to ginger ale and vanilla extracts, these can simply not be prepared without alcohol. Finally, non-alcoholic extracts do not keep well unless 10 per cent. or more of alcohol is added, when, of course, they cease to be non-alcoholic.—*Drug. Circ.*, 63 (1919), 525. (C. P. W.)

Flies and Larvæ.—*Destruction of.*—George Boye and Rene Guyot report that castor oil (especially when a little croton oil is added), or cobold (black arsenic) are the best fly destroyers, while their larvæ are destroyed best by alkalies, acid, or sodic cresylol.—*Chem. and Drug.*, 91 (1919), 293. (K. S. B.)

Glues.—*Water-Resistant.*—In aeroplanes it is not safe to employ the ordinary glues, even with application of water-proof coatings. Gelatin glues cannot be made to resist humid conditions, except

upon application of water-proof coverings. Glues made from blood-albumin and casein are somewhat more resistant to moisture, in that the quantity absorbed is limited, and the glue will still hold together surfaces joined by it. According to F. L. Browne, a "blood" glue which gives general satisfaction, can be made as follows: Six parts of black blood albumin are allowed to macerate in 11 parts of water for some time. Any undissolved material is removed by straining, and to the clear mixture ammonia water and calcium hydroxide, in desired quantity are added. These glues are caused to harden by heating to the temperature at which albumin coagulates. A satisfactory wet glue is prepared as follows: 100 parts of casein are macerated for 15 minutes in varying quantities of water, depending upon the consistence desired. Subsequently a mixture of from 15 to 22 parts of calcium hydroxide and 90 parts of water is added, and finally the whole is mixed with 70 parts of solution of sodium silicate.—Chem. Met. Eng., 21 (1919), 136. (G. C. D.)

Guano and Peat.—*Analysis of East Coast.*—A sample of East Coast guano analyzed by J. F. Tocher yielded 1.5 per cent. nitrogen, 8.5 per cent. insoluble phosphates, and 0.5 per cent. potash. A sample of peat showed very poor results compared with that from other localities, it yielding only 1 Cwt. ammonium sulphate per 1.5 tons of peat.—Chem. and Drug, 91 (1919), 48. (K. S. B.)

Insecticides.—The paper by G. M. Beringer, Jr., deals with insecticides for the destruction of household vermin discussed in Bulletin Nos. 701 and 771 of the U. S. Dept. of Agriculture. For the destruction of bed-bugs kerosene was found to be more efficient than gasoline. Coal-tar-cresote emulsions are only efficacious when applied undiluted. Turpentine and sabadilla seed are also rated 100 per cent. effective. The use of paraformaldehyde, formaldehyde, sodium-fluoride and Paris green is discouraged. Against roaches, sodium fluoride and pyrethrum (fresh and unadulterated) are highly recommended, while borax and phosphorous pastes are only slowly and partially effective. Against moths naphthalene, cedar leaf oil and pyrethrum proved highly effective. Camphor less so. In cedar chests moths and larvæ die. Kerosene or hot water, strong soap suds kill larvæ. Sulphur when burned is partially effective. Powdered cloves and oil of lavender have some value, while lavender flower oil is declared valueless.—Proc. N. J. Pharm. Assoc., 49 (1919), 83. (J. H.)

New Liquid Fuel.—B. D. Ossa describes "E. H. A.," so named from the initials of its constituents, ether, hydrocarbon and alcohol. It consists of 65 parts of 95 per cent. alcohol, 10 parts of ether and 25 parts light gas benzin. It is said that it would be easy to produce in Chile.—*Bol. soc. fomento fabril*; through *Chem. Abstracts*, 13 (1919), 2271.

Insecticide.—*Calcium Arsenate.*—Use a good grade of lime, containing a high percentage of CaO. Slake the lime to as smooth a paste as possible, for upon this depends the smoothness of the final product, as well as the readiness with which the lime and acid react. Use from 3 to $3\frac{1}{2}$ times as much water by weight, as lime, and have it, preferably, warm. Let stand for a while, then thoroughly mix, after which add twice as much hot water as used for slaking, and mix again. The lime and arsenic should be in such proportion that the weight of actual CaO used will equal that As_2O_5 used. This gives a product with molecular ratio slightly over 4, which is necessary if the soluble As_2O_5 is to be kept down to desirable limits. Add the acid at room temperature to the lime as quickly as possible, and stir well until the liquid becomes alkaline to phenolphthalein. Filter to as dry a state as possible, do not wash, and if a dry product is desired, dry directly in any suitable manner. Crush in a suitable disintegrator, or grind if necessary. To produce 100 pounds of a commercial grade of calcium arsenate by this process will require 45 pounds of CaO (approximately 50 pounds of a high-grade lime) to be slaked with 18 gallons of water, the addition of 36 gallons more of water, and then 45 gallons of a solution containing 1 pound of As_2O_5 per gallon.—*Bull.*, 750, U. S. Dept. Agric.; through *Pharm. Era*, 52 (1919), 13.

Insecticide.—*Horticultural.*—For combating harlequin cabbage bugs, white grubs, San José scale, scruffy scale, oyster shell bark lice, woody aphides, onion maggots, apple root plant lice, chinch bugs, grape phylloxeras, grape vine leaf hoppers, hop plant lice, pear tree psyllas, red orange scale, and California live oak scale, Prof. E. V. Howell, of the University of North Carolina, recommends a kerosene emulsion with whale oil soap, having the composition:

Kerosene.....	85.3 oz.
Whale oil soap.....	2.6 oz.
Water.....	42.6 oz.

He dissolves the soap in the water by the aid of heat, then at once adds the kerosene, and churns.—*Drug. Circ.*, 63 (1919), 17.

Nail Polish.—*French.*—A French perfumery journal recently gave the following formula and stated that it produced a really efficient product if properly prepared and used:

Oxide of tin.....	250 grammes
Powdered tragacanth.....	1 gramme
Glycerite of starch.....	3 grammes
Orange flower water.....	100 grammes
Alcohol.....	enough

Add alcohol to the powdered tragacanth in a mortar, to produce a smooth paste. Then add the glycerite of starch and the orange flower water, triturating to a homogeneous mucilaginous fluid. Add the oxide of tin and knead into a plastic mass which should not be too stiff. A little more water may be added, if necessary, to bring it to the proper consistency. A little eosin is sometimes added to impart to the preparation a delicate pink tint.—*Drug. Circ.*, 63 (1919), 288.

Paper Bandages.—*Use in Germany.*—The use of paper bandages to fix the padding under and over plaster casts or splints, and for all wound dressings when a cloth or elastic bandage is ultimately to be used, is recommended by Gocht. They are less suitable for outer bandages, and useless as compress dressings. The present thin, creped bandages are usable in all widths, but are easily torn. A thicker, stronger and untearable bandage is recommended, but must be used in narrow strips to make it adhere closely.—*Chem. and Drug.*, 91 (1919), 5. (K. S. B.)

Rubber Gloves.—*Mending.*—According to J. F. Cotton an ordinary library filing card is spread rather heavily with library paste, and the rubber mending tissue placed on it; the tissue is rubbed flat on the card, and the whole set aside to dry. When a rubber patch is required a piece is cut out—rubber, card and all—of a size to fit the tear. The rubber glove is now put on the hand, inside out; the patch is smeared with cement, and allowed to become tacky, fitted on to the damaged part of the glove and pressed home hard. If the tear is large, it is easier to lay the moistened

patch down and fit the edges of the tear to it, then press. It only remains to dust the part with French chalk, and set aside. Later, the glove, or mended part of it, is soaked in water, when the bit of card will come away as the paste softens. This gives a secure patch adhering clear to the edges, flat and water-tight, and fit to stand boiling as well as any patch is.—J. Am. Med. Assoc.; through Pharm. Era, 52 (1919), 203.

Colored Smokes.—*Manufacture of.*—Colored smokes, which are really not smokes, but sublimed chemicals, and which were used in war as signals, by daylight, may be made as follows: *Yellow or Orange.*—Realgar, sulphur and saltpetre, equal parts. Or, orpiment, 40 parts, saltpetre 33 parts, sulphur 25 parts. Mix the finely powdered ingredients and tamp into a card or metal cylinder, 3 inches long by 1 inch in diameter, and plug the ends securely with cork or clay. Bore several $\frac{1}{4}$ inch holes in the side of the tube, and insert a quick-match 1 inch into the mixture. When lighted, part of the realgar or orpiment is sublimed into a dense yellow or orange cloud.

Red.—Rhodamine B, 7 parts; potassium chlorate, 3 parts; sodium chloride, 1 part. Use as directed for yellow or orange smokes.—Chem. and Drug., 91 (1919), 1226. (K. S. B.)

Soft Drinks.—*Use by the Ancients.*—The favored drink of the old Egyptians, composed of beer, milk and honey, reappears in Grecian history as *kykeon* in almost as many different forms as the soft drinks of modern times. All kinds of beer, wine, fruit juices, fresh and dried fruits, and even grated bread, were used in its composition. In general, its basis was a barley soup to which wine, honey, grated cheese, aromatic herbs and costly spices were added.

Similar mixed drinks in equal variety were much favored by the ancient Romans, who here, as in many other circumstances, owed much to the Greeks. Worthily of special notice is the *poska* of the old Romans, which was a drink playing a prominent part in their numerous military expeditions. Originally it was a beverage made of vinegar and water, but later was compounded with honey, sour milk, whipped eggs and other additions.

It appears that drinks with a vinegar basis were much in favor in the sixteenth century with military commanders as a sustaining drink for soldiers on the march.

The inventive genius of the compounders of mixed drinks seems to have had as wide a play in ancient times as in modern. Thus the ancient Egyptians, according to the Ebers papyrus, flavored their beer (which was apparently a millet beer) with figs and other fruits. When we are told that kykeon was used by the upper class of Greeks in their Eleusinian feasts, we may well assume that it was prepared with special regard to good flavor.—Am. Bottler; through Drug. Circ., 63 (1919), 208.

Surgical Dressings.—*Review of German.*—Seel and Hils discuss at length the surgical dressings used before and during the war. The materials considered are first, bandage wadding and its substitutes and the topics are source, color, physical condition, "feel," length of fiber, absorptive power, water content, ether extractive, ash, water extractive, reducing substances; secondly, gauzes, mulls and their substitutes, as to resistance to tear, strands per square centimeter, ash, water content, ether extract, alcohol-benzene extract, copper number (Schwalbe), fural and pentosan content, cellulose, methyl oxide number and lignin.—Ber. pharm. Ges.; through Chem. Abstracts, 13 (1919), 2413.

C—PREPARATIONS

ACETI.

Vinegar of Sabadilla.—*Manufacture of.*—P. Fleissig prepares this by dissolving 5 grammes of veratrine in 750 grammes of 40 per cent. acetic acid, and then adding 4 grammes of tincture of caramel and water to make 5 liters.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 56.

AQUE.

Bitter Almond Water.—*Artificial.*—K. Feist suggests as substitute for the official water, a preparation made by mixing 5 grammes of mandelic acid nitrile, $C_6H_5CH(OH)CN$, 192 grammes of 90 per cent. alcohol and 803 grammes of water.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2968.

Cherry Laurel Water.—*Manufacture and Assay of.*—D. van Os believes that in preparing cherry laurel water the directions of the

Dutch Pharmacopœia should not strictly be adhered to because of varying physical and chemical properties of the leaves, their age, etc. He recommends replacing distilled water in the distillation by ordinary tap water, as is done in the previous edition of the Pharmacopœia. Liebig's method for estimating the hydrocyanic acid should be replaced by Denigès' method because cherry laurel water is liable to contain traces of ammonia. He recommends that on distilling 1000 parts of leaves, 900 to 1000 parts of distillate should be obtained, which should be perfectly clear and neutral to Congo paper. Twenty-five mls of the water should not leave a weighable residue on evaporation. The amount of permissible N/100 silver nitrate solution used in the determination of the hydrocyanic acid should be increased from 6.2 to 8.0 mls. The odor test for benzaldehyde should be omitted. In the discussion of this paper it was pointed out that it is advantageous to warm the leaves and the water gently for a few hours before distillation in order to give the enzyme opportunity to act. Furthermore that while the above modification gives good results when carried out on a small scale, the results are less satisfactory when tons of the leaves are distilled in one operation.—Pharm. Weekblad, 56 (1919), 769. (H. E.)

Cherry Laurel Water.—*Strength from Different Species of Laurocerasus.*—G. O. A. De Thouars prepared cherry laurel water from 9 species of *Laurocerasus* and then made a comparative study of the products. He finds that the strongest cherry laurel water is made from *Laurocerasus schipkænsis* and that the next strongest were *L. colchica*, *L. caucasica*, *L. rotundifolia* and *L. latifolia*. As the plants and leaves of *L. schipkænsis* are too small for practical utilization, the best species for making cherry laurel water are *L. colchica* and *L. caucasica*; while water prepared from the ordinary cherry laurel leaves is the poorest. Young leaves give a water of the highest hydrocyanic content.—Pharm. Weekblad; through Chem. Abstracts, 13 (1919), 1899.

Cherry Laurel Water.—*Substitute for.*—R. Holdermann states that in addition to the seasonal variations in the potency of the leaves previously recorded, it is shown that the old leaves of spring and autumn yield considerably less hydrocyanic acid than the young leaves of summer. While the concentration of free hydrocyanic acid remains nearly constant, the ratio of free to

total acid decreases with the age of the leaves. An artificial cherry laurel water was obtained by distilling a mixture of potassium ferrocyanide and sulphuric acid into diluted alcohol, determining the amount of hydrocyanic in the distillate, adding the requisite amount of benzaldehyde, and allowing the mixture to stand for three days. It then becomes perfectly clear, and the ratio of free to combined hydrocyanic acid is 1:4.4. In about a month this becomes 1:6, which corresponds very closely with the ratio in natural cherry laurel water.—Arch. Pharm.; through Pharm. J., 103 (1919), 383.

Chloroform Water.—*Use in Liquid Prescriptions.*—E. Crouzel finds that chloroform water is a valuable addition to extemporaneous prescriptions for stomach trouble, not merely because of its preservative action upon the other ingredients of the prescription, but also because of its own algesic properties.—Rep. pharm.; through Chem. Abstracts, 13 (1919), 1743.

CAPSULÆ.

Capsules.—*Administration of Deliquescent Medicines in.*—N. S. Davis states that a convenient way of dispensing liquids and deliquescent substances in capsule form is to first make a pill in which the medicinal agent is incorporated and inserting this pill into a capsule. The pill is made of a mass consisting of one part beeswax and three parts castor oil. Guaiacol, oil of sandalwood, potassium iodide and similar substances may be thus administered.—J. Am. Med. Assoc.; through J. Am. Pharm. Assoc., 8 (1919), 423. (H. H. S.)

CARBASUS.

Cyanide Gauzes.—*Preparation and Assay.*—Harvey and Mackley prepare double cyanide gauze, so extensively used for field dressings during the war, by impregnating large rolls of gauze with a previously prepared paste containing about 50 per cent. of mercury and zinc cyanide. Rapid methods of analysis used by the authors for the control of both paste and finished gauze were described in paper read before the Society of Public Analysts.—Chem. News, 118 (1919), 236.

CERATA.

Camphor Paraffin.—*Formaldehyde-Phenol in.*—Connell states that this antiseptic combines the rapid sterilizing action of formaldehyde with the slow embalming action of phenol, while the presence of camphor paraffin as a solvent mitigates the painful properties of formaldehyde and the local and general toxicity of phenol. The following mode of preparation is given: (A) To 70 parts of powdered camphor add 30 parts of phenol liquefied by heat; a clear solution results. (B) Melt together about 3 parts of paraffin (50° m. p.) and 9 parts of liquid petrolatum, adjusting the proportions until the mixture frosts on the bulb of a test thermometer at 40°. Add 45 parts of A to 50 parts of B, which yield a solution freezing at 35°. A 10 per cent. solution of formaldehyde in alcohol is prepared (C), preferably by adding formaldehyde to alcohol and dehydrating by desiccated sodium sulphate. To 9 parts of the mixture of A + B at 40° add slowly 5 parts of C; a clear solution of all the ingredients results, which freezes and melts at 36°. Swig., Gyn. and Obstet.; through Chem. and Drug., 91 (1919), 63.

COLLODIA.

Belladonna Collodium.—This preparation, sometimes called liquid belladonna plaster, is obtained from 5 parts of fluidextract of belladonna, 4 parts of Canada balsam, 2 parts of castor oil, 1.5 parts of camphor, 2.5 parts of pyroxylin and enough ether to 100 parts.—Pharm. Weekblad, 56 (1919), 1610.

EMULSA.

Emulsions.—*Modern Conception of.*—W. Clayton reviews the various theories of emulsions in which the author gives numerous references and a critical discussion of each theory, illustrated by many examples. All emulsions consist of a continuous phase and a discontinuous or "disperse" phase. Clayton favors the adsorption theory which is that oil or water particles, as the case may be, receive a coating or surface film which acts in three principal directions: (a) The interfacial tension is decreased so that the dispersed particles do not coalesce so readily, (b) an electrical charge is conferred on the particles possibly by ionic adsorption and this charge will cause electrical repulsion between the particles, (c) there is a purely mechanical action keeping the particles

separated. The surface tension of a film is less on the side wetted and so the film becomes spherical with the wet surface exterior. To illustrate: sodium soaps are more easily wetted by water than by oil and give a dispersion of oil in water, while calcium soaps are more easily wetted by oil and so give a dispersion of water in oil.—J. Soc. Chem. Ind.; through Chem. Abstracts, 13 (1919), 1785.

Emulsions.—*Then and Now.*—Prof. E. L. Patch after defining the word emulsion and mentioning some of the old forms of emulsions prescribed outlines the various methods employed for producing emulsions, together with some of the incompatibilities and conditions that effect the permanency of emulsions.—Pract. Drug., Dec. 1919, 21. (H. H. S.)

Emulsion of Aspidium.—George Elliot recommends the addition of olive oil to the oleoresin of aspidium before emulsification, in order to expedite the operation, the amount of oil to be used varying with the thickness of the oleoresin, about four times as much oil as oleoresin answering well when the latter is very stiff.—Chem. and Drug., 91 (1919), 387. (K. S. B.)

This paper, which was read before the Edinburgh Branch of the Pharmaceutical Society, brought forth several letters pointing out the danger of administering aspidium in the oleaginous base, because of the possible toxic effect produced by the absorption of filicic acid by the intestine through the medium of fatty oils.—Pharm. J., 102 (1919), 278, and Chem. and Drug., 91 (1919), 42.

Emulsion of Oil of Chenopodium.—This can be prepared from 5 parts each of oil of chenopodium and acacia, 45 parts of syrup of orange and 45 parts of water.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Marylebone Cream.—This preparation (*Cremor Maryleboniensis*) is used at the St. Marylebone General Dispensary as a substitute for cream in infant feeding. Its recipe is:

Linseed oil.....	1 ounce
Benzoic acid.....	$\frac{1}{2}$ grain
Saccharin.....	$\frac{1}{2}$ grain
Oil of bitter almond.....	1 minim
Decoction of Irish moss.....	2 ounces

Dose: half to one teaspoonful to each bottle of diluted milk.—
The Prescriber; through Am. J. Pharm., 91 (1919), 310.

Suet Emulsion.—*Use in Infant Feeding.*—The following formula is given by C. H. Hampshire and G. E. G. Hawker for the production of an emulsion of fats which will supply the anti-rachitic factor (the vitamine known as fat-soluble A):

Beef suet.....	40 ounces
Olive oil.....	5 ounces
Syrup.....	25 ounces
Benzoic acid.....	35 grains
Decoction of Irish moss.....	70 ounces
Water to make.....	1 gallon

Melt the suet, add the oil, and dissolve the acid in this mixture. Heat the decoction to 60° C., place in the emulsifier, add the fats at about the same temperature, and work up the emulsion, adding the syrup and water last. As arachis oil is superior to olive oil in anti-rachitic effect, it is suggested that arachis oil be used in the emulsion. This emulsion is known in England as *University Cream*.—Chem. and Drug., 91 (1919), 826. (K. S. B.)

EXTRACTA.

Extract of Belladonna.—*Alkaloidal Assay of.*—Goris and Beausite think it is desirable because of differences that have arisen regarding the alkaloidal value of extract of belladonna as determined by French and English analysts, that a uniform method should be internationally adopted. The authors show that the process of the British Pharmacopœia (1898!) involves losses due to incomplete removal of the alkaloids during the process of shaking out, to the numerous manipulations, and to the drying at 100°, by which a volatile alkaloid is driven off. Preference is given to the process of the French Pharmacopœia, which is simpler and determines the *total* alkaloid.—Bull. Sci. Pharm.; through Pharm. J., 102 (1919), 346.

Licorice Extract.—*Comparative Investigations on.*—W. Zimmermann has studied the methods of glycyrrhizin assay and of the determination of the water-insoluble and alcohol-soluble portion of

this extract. He finds Gluecksmann determination of the latter best suited to drug store practice, while Hafner's method is the most satisfactory glycyrrhizin assay. He thinks that the water content of the extract should not exceed 17 per cent., the ash should be not more than 11 per cent., the glycyrrhizin content at least 10 per cent. and the water-insoluble portion not more than 25 per cent. The latter should be examined microscopically.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2962.

Extract of Malt and Cod Liver Oil.—*Percentage of Oil in.*—H. D. Richmond calculates as follows:

$$\text{Percentage by weight} = \frac{V \times \text{sp. gr. oil}}{V \times \text{sp. gr. oil} + (100 - V) \text{ sp. gr. extract}}$$

$$\text{Percentage by volume} = \frac{W \times \text{sp. gr. extract}}{W \times \text{sp. gr. extract} + (100 - W) \text{ sp. gr. oil}}$$

V = volume. W = weight.

It is usually safe to consider the specific gravity of the oil as 0.927 and of the extract as 1.410.

Richmond thinks that the minimum oil content should be 15 per cent. by volume or 10.4 per cent. by weight.—Analyst; through Chem. Abstracts, 13 (1919), 2106.

FLUIDEXTRACTA.

Fluidextracts and Tinctures.—*Permanence of Alkaloidal.*—At the Richmond meeting of the American Pharmaceutical Association in 1910, W. L. Scoville reported upon the keeping qualities of about fifty fluidextracts and tinctures. After keeping what remained of these preparations under normal storage conditions they were re-tested by the method used ten years earlier. Mr. Scoville finds deterioration mainly due to the unstable nature of the alkaloids and to precipitation of secondary constituents that carry down alkaloids also.

The fluidextracts of colchicum corm and colchicum seed and both tincture and fluidextract of veratrum remained perfectly clear but were much reduced in alkaloidal content. The acetic

fluidextract of sanguinaria was nearly inert; sanguinaria alkaloids are readily decomposed though the heavy precipitate possibly influenced deterioration. Change in alkaloid largely explained the loss in coca and pilocarpus, though both showed much precipitation. Contrary to general belief, the mydriatic alkaloids showed little deterioration except in case of stramonium. Physostigma and aconite had changed very little.

Mechanical holding of alkaloids by the precipitate is marked where tannoid bodies are present as in aspidosperma, cinchona, coca, kola, and guarana. Loss of strength seemed to be directly proportional to the amount of precipitate.

In general any large amount of precipitate should be taken as an indication of loss of strength. To what extent the percentage of alcohol influenced keeping qualities is not indicated by the findings.

Mr. Scoville gives much valuable information about individual preparations as well as a table showing alcoholic strength, standard, results of assay of 1910 and 1919, percentage of loss and physical condition of the fifty preparations.—J. Am. Pharm. Assoc., 8 (1919), 799. (Z. M. C.)

Fluidextracts and Tinctures.—*Determination of Extractive Matter in.*—Eschbaum gives the following simple method for estimating the extractive matter in liquids. A piece of filter paper 20 cm. long and 6-7 cm. wide is clamped into a copper frame and dried to constant weight. Two to 3 mls of the liquid are then transferred to the paper, the liquid evaporated and paper and residue are dried at 108°. The increase in weight of the paper is the amount of extractive matter present in the quantity of liquid taken.—Pharm. Weekblad, 56 (1919), 960. (H. E.)

Fluidextract of Condurango.—*Evaluation of.*—Bohrisch characterizes the pharmacopœial (Pharm. Germ. V) tests for this preparation as inadequate. He concludes that it is desirable that the next pharmacopœia provide standards for density, dry residue and ash; that Linke and Richters test gives juster conclusions than the present requirement that the fluidextract mixed with 4 parts of water clouds upon boiling, but clears again upon cooling; that the ether and chloroform extracts of the condurango residue are useful criteria in the evaluation of the fluidextract.—Pharm. Zent.; through Chem. Abstracts, 13 (1919), 2967.

Fluidextract of Frangula.—*Preparation of.*—F. Emich moistens the drug in a percolator with double its weight of alcohol. After 6 days' maceration, it is percolated at the rate of 150 to 200 drops a minute, the residual mass being subjected to expressing in a tincture press, after which it is again extracted with double its weight of alcohol, the marc again expressed and extracted with alcohol for a third time. The second and third percolates and expressed liquids are evaporated to 15 parts and mixed with the 85 parts of the first percolate and expressed fluid.—Pharm. Ztg., 64 (1919), 206.

Fluidextract of Glycyrrhiza.—*Manufacture.*—A. Armentano reports upon a method of preparing this fluidextract by maceration and percolation with hot water, evaporation, and addition of alcohol. He finds the glycyrrhizin content and total extractive equal those of a fluidextract made by the official process. The preparation filters readily and leaves little residue.—J. Am. Pharm. Assoc., 8 (1919), 958. (Z. M. C.)

Fluidextract of Kola.—*Preparation.*—I. Slis reports that fluid-extract of kola when prepared according to the Netherland Pharmacopœia with dilute alcohol rapidly loses in strength; some of the caffeine settling down with the inert matter. He, therefore, recommends making the fluidextract with stronger alcohol.—Pharm. Weekblad, 56 (1919), 1071. (H. E.)

Fluidextract of Sabal.—*Properties of.*—Griebel found that in fluidextract of saw palmetto by the addition of water a strongly milky turbidity is produced, due to the separation of fats and esters. By shaking the fluidextract with pentane these substances could be separated from the other constituents of the drug. The ester-free fat was easily soluble in alcohol and was rich in free fatty acids, having an acid value of 70.3. The fat as well as the esters possessed a pronounced odor of caproic acid. The author further found that the esters are not pre-existent in the drug, but are formed in the percolation of the latter with diluted alcohol by means of an esterifying enzyme, which is present in the drug. Besides these substances, the extract contained invert sugar, mannite, tannic acid and an organic acid which differed from the ordinary fruit acids, but could not be identified.—Apoth. Ztg.; through Drug. Circ., 63 (1919), 503.

Fluidextract of Salicaria.—*Use in Diarrhea.*—H. Dubois finds this fluidextract of great value in diarrhea and dysentery, when administered in doses of 3 to 4 grammes during 24 hours.—Bull. Acad. Med.; through J. pharm. chim., 20 (1919), 70.

GLYCERITA.

Iodoglycerol.—*Use in Pyorrhea.*—E. C. Talbot gives a formula which has been extensively used in dental practice throughout the world for the treatment of pyorrhea alveolaris and the general cleaning of the gums and mucous surfaces before operating. It consists of 15 parts zinc iodide, 25 parts iodine, 10 parts distilled water and 50 parts glycerin.—Am. Drug., 67 (1919), 357.

Lubricating Jelly.—The subjoined formula for an inexpensive lubricating jelly has been used in the German Hospital (now the Lankenau Hospital), Philadelphia, for a number of years: Tragacanth, whole, 3 grammes; glycerin, 25 mls; phenol, 1.5 gramme; distilled water to make 300 mls. The tragacanth is broken in small pieces and put into a wide-mouthed bottle; the other ingredients are added and the bottle is frequently shaken.—J. Am. Med. Assoc., 73 (1919), 1852. (W. A. P.)

LINIMENTA.

Acriflavine Emulsion.—*Use as Wound Dressing.*—Stowell states that he has shared the disappointment which many surgeons have experienced in using 1:1,000 flavine solution in normal saline. The value of liquid petrolatum as a wound dressing being now recognized, he sought a combination of this fluid and flavine, combining the properties of both. The author states that he is indebted to Mr. Griffith Humphreys, Ph.C., High Street, Northwich, for the patience and skill with which he has worked out a stable emulsion, the droplets of which, examined under the microscope, are seen to be similar in size to those in a good emulsion of codliver oil. The use of this emulsion as a wound dressing has given him clinical results he had not dared to hope for. Mr. Humphreys' formula for the emulsion is as follows:

Acriflavine.....	0.1
Thymol.....	0.005
White wax.....	4.0
Liquid petrolatum.....	76.0
Distilled water.....	20.0

It is put up on small sterile bottles.—Brit. Med. J.; through Chem. and Drug., 91 (1919), 270.

Camphorated Oil.—*Quality of.*—H. H. Schaefer reports as follows: 50 samples collected. 18 ran below 18 per cent.; average for 50 samples was 17.68 per cent.; highest was 26 per cent.; lowest was 7.5 per cent.; total volume of 50 samples was 50½ fluid-ounces; average price was 30 cents for one ounce and 20 cents for one-half ounce, including container; highest price for one ounce was 30 cents; lowest price for one ounce was 15 cents; highest price for one-half ounce was 20 cents; lowest price for one-half ounce was 10 cents.—Proc. N. J. Pharm. Assoc., 49 (1919), 202. (J. H.)

Camphorated Oil.—*Toxicity of.*—On the basis of twenty cases of poisoning with camphorated oil without fatal result, R. W. Benz concludes that there does not seem to be any mortality associated with a dose of camphorated oil up to 1½ tablespoonfuls although in some cases the symptoms are alarming. The treatment seems to be the hasty removal of the stomach contents by means of an emetic, following which the patients rapidly recover.—J. Am. Med. Assoc., 73 (1919), 1217. (W. A. P.)

Camphorated Oil.—*Tumors Resulting from Use of.*—W. H. Mook and W. G. Wander report on tumors resulting from the injection of camphorated oil. They conclude that these were caused by liquid petrolatum which appears to be used by at least one well-known drug manufacturer in the preparation of camphorated oil. The authors have reached the conclusion that it is dangerous to use liquid petrolatum as a vehicle for any remedy to be injected in subcutaneous tissue.—J. Am. Med. Assoc., 73 (1919), 1340. (W. A. P.)

Chloroform Liniment.—*Loss of Chloroform by Spontaneous Evaporation.*—This liniment decreases greatly in chloroform content upon spontaneous evaporation. Alcohol is also lost but not so quickly. The chloroform strength of the liniment therefore decreases in spite of the fact that the volume of liniment is lessened by evaporation of alcohol. Tests by George Éwe show a 17.7 per cent. loss of chloroform in 5 days and 29.8 per cent. in 10 days at room temperature from quantities of liniment kept in tall cylin-

ders covered with two layers of cheesecloth.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 177. (R. P. F.)

Emulsio Sulfurata ad Scabiem, Habermann.—This contains 30 grammes of medicinal soap, 9 grammes of lanolin, 171 grammes of water and 90 grammes of precipitated sulphur.—*Pharm. Weekblad*, 56 (1919), 154. (H. E.)

Liniment of Soft Soap.—F. M. Jordan proposes the following formula and method of preparation: Dissolve 55.9 grammes potassium hydroxide in 180 mls of water and while still hot add 279.5 grammes cottonseed oil and 180 mls alcohol. Stir until a clear liquid soap results (about ten minutes), set aside for one hour, add sufficient (200 mls) alcohol to liquefy, and 112.5 mls water. Finally add 20 mls oil of lavender and sufficient alcohol to make the measure up to 1,000 mls. Let stand for one week and filter. The product is claimed to conform in every way to the official requirements.—*Am. Drug.*, 67 (1919), 210.

Solidified Liniment.—The following recipe is suggested:

Oil of origanum.....	10
Oil of sassafras.....	10
Oil of turpentine.....	10
Camphor.....	10
Oleoresin of capsicum.....	5
Fluidextract of aconite.....	4
Petrolatum.....	30
White wax.....	21
Alkanet root.....	to color

Suspend the alkanet root, bruised, in the petrolatum, heated, until it imparts a strong red color. Add the wax, and when it is melted, remove the heat. Just before the mixture is ready to solidify, add the fluidextract, and the oils in which the camphor has been dissolved, and mix. Then add the oleoresin and mix thoroughly.

The amount of capsicum should be reduced when the liniment is for use on tender skin, or the liniment may be diluted with petrolatum.—*Med. Drug.*; through *Drug. Circ.*, 63 (1919), 240.

Linimentum Calamina.—John K. Thum advocates the following formula for a calamine lotion that will not dry on the skin

like the ordinary lotion:

Powdered Tragacanth.....	4.50
Phenol.....	1.50
Glycerin.....	1.50
Calamine.....	25.00
Zinc Oxide.....	25.00
Cottonseed Oil.....	150.00
Distilled Water enough to make.....	500.00

Prepare like an emulsion.—Proc. Penna. Pharm. Assoc., 42 (1919), 270. (R. P. F.)

Opodeldoc.—*Detection of Methyl Alcohol in.*—Boucher gives the following method: Five mls of opodeldoc are mixed with 10 mls of warm water and 10 drops of a diluted calcium chloride solution. The mixture is then filtered, 8 mls of the filtrate are distilled and two fractions of 2.5 mls each are collected. To one fraction 2 mls of iodine solution and 5 mls of ammonia water are added, when in the presence of methyl alcohol iodoform is formed after allowing the mixture to stand for one-half hour. The other fraction is oxidized in the usual way with potassium permanganate and the liquid is tested for formaldehyde with fuchsin-sulphurous acid.—Bull. sci. pharmacol.; through Pharm. Weekblad, 56 (1919), 659. (H. E.)

LIQUORES.

Isotonic Eye Solutions.—A solution of sodium chloride containing 14 grammes in a liter is isotonic with the lachrymal secretion, and it has been proved that a solution of this strength is best borne by the corneo-conjunctival epithelium. A reduction must be made for the amount of any medicament that may be added, and this is ascertained in the usual way, *viz.*, by dividing the molecular weight of sodium chloride by that of the medicament and multiplying by the weight of the latter used. It must be remembered that one molecule of atropine sulphate is equivalent to two of sodium chloride. In the case of zinc sulphate and copper sulphate, sodium sulphate should be substituted for sodium chloride in the proportion of one of each of the sulphates for two of the chloride, and in the case of silver nitrate sodium nitrate should be substituted for the chloride.—J. Pharm. Belg.; through Pharm. J., 102 (1919), 219.

The following prescriptions are recommended:

Cocaine hydrochloride.....	0.5 gramme
Sodium chloride.....	0.625 gramme
Distilled water.....	to 50.0 mils
Zinc sulphate.....	0.5 gramme
Sodium sulphate.....	1.35 Cgm.
Distilled water.....	to 50.0 mils
Silver nitrate.....	0.5 gramme
Sodium nitrate.....	0.776 Cgm.
Distilled water.....	to 50.0 mils

A 2 per cent. solution of boric acid (*i. e.*, half the strength of a saturated solution) requires no addition, being practically isotonic, a fact which probably accounts for the popularity of boric acid as an eye lotion.—The Prescriber; through Pharm. J., 103 (1919), 434.

Arsenical Solutions.—*History of.*—H. A. Langenhan calls attention to the origin of some well-known preparations beginning with "Tasteless Aque and Fever Drops" in 1771. A few years later Dr. Fowler introduced his "Liquor Mineralis," which in 1809 was included in the London Pharmacopœia and which appeared also in 1820 U. S. P. Dr. DeValangins' "Solution of Solvent Mineral" appeared in the London Pharmacopœia of 1851 and in the 1870 edition of the U. S. P., in the latter under the name of solution of arsenious acid. Likewise Dr. Donovan's preparation appeared in 1851 in the Dublin Pharmacopœia and the 1850 U. S. P. At present it occurs in the British Pharmacopœia as well as in the U. S. P.—J. Am. Pharm. Assoc., 8 (1919), 189. (Z. M. C.)

Compound Solution of Cresol.—F. M. Jordan proposes the following formula for making compound solution of cresol, which he states is satisfactory both from a standpoint of economy of labor and materials and superiority of the finished product, which forms brilliantly clear solutions with water in all proportions: To 40 grammes of sodium hydroxide, which must be of full strength, contained in a suitable tared vessel, add 150 mils of water and stir until solution has been effected. While still hot, in a thin stream and under constant stirring, add 300 grammes of linseed oil. Continue the stirring until the mass acquires the appearance and consistency of an emulsion and set aside, without further stirring, for twelve hours or over night. To the soap thus formed add the cresol

and sufficient water to make the finished product weigh 1,000 grammes and stir the mixture until complete solution has been effected, which may be hastened, if desired, by the application of gentle heat. Sodium hydroxide of less than full strength may be used provided its actual strength be taken into account.—Pharm. Era, 52, (1919), 175.

Compound Solution of Cresol.—*Improved Recipe for.*—S. L. Hilton recommends the following:

Cresol.....	500 grammes
Oleic acid.....	226 grammes
Sodium hydroxide.....	35 grammes
Water, to make.....	1000 grammes

Dissolve the sodium hydroxide in 100 mls of water and filter through cotton. Weigh the oleic acid in a tared bottle or flask, add the cresol and shake well. Add the solution of sodium hydroxide; shake thoroughly until saponified and add sufficient water to bring the weight of the product to 1000 grammes.

This preparation can be made in 15 minutes and costs about 60 cents a litre, as compared to 90 cents a litre for the official product.—J. Am. Pharm. Assoc., 8 (1919), 759.

Dakin's Solution.—*Manufacture of.*—S. R. Benedict prepares Dakin's solution by fixing to a 1000 mil flask containing 900 mls of 20 per cent. solution of anhydrous sodium carbonate, a Folin absorption bulb and attaching to the flask a 100 mil absorption bottle containing 90 mls of 10 per cent. sodium hydroxide solution. The flask and bottle are placed on a torsion balance and chlorine gas from the tank of liquid chlorine is passed into the flask. As the chlorine passes into the carbonate solution, carbon dioxide is given off but this is absorbed by the sodium hydroxide in the absorption bottle, hence the gain in weight represents added chlorine. Exactly 43 grammes of chlorine are thus passed into the solution during 20 to 30 minutes after which the contents of the flask are diluted to 10 litres. Such a dilution has a hypochlorite content of 0.46 to 0.49 per cent., is quite stable, and never has to be corrected for alkalinity.—Surgery, Gynecol. and Obstet.; through Chem. Abstracts, 13 (1919), 1327.

Dakin's Solution.—*New Recipe for.*—C. Pagel considers that the usual Dakin's solution is too alkaline and recommends that it

be made by mixing the chlorinated lime with water and then filtering; dissolving the sodium carbonate in water and then filtering, and after mixing the two solutions, filtering off the precipitated calcium carbonate. This carbonate precipitate he dissolves in hydrochloric acid and then he uses the resulting calcium chloride solution to exactly neutralize the chlorinated solution, thus obviating the use of boric acid.—Bull. sci. pharmacol.; through Am. J. Pharm., 91 (1919), 316.

Dakin's Solution.—*Practical Notes on.*—H. L. Overton states that it is his object to give in this article the essential points to be borne in mind in the preparation of a satisfactory preparation. He gives the technique of Dr. Daufresne and a general method of making the Carrel-Dakin Solution. • He claims that in order to obtain a stable and neutral product both the chlorinated lime and the sodium carbonate must be accurately assayed. The sodium carbonate must be carefully protected from moisture. Alkalinity of the solution is in many instances due to the improper amount of carbonate used. An excess of bicarbonate used is often the cause for the instability of the product, a fact which Overton proves by experiments cited.—Pharm. J., 102 (1919), 388. (C. P. W.)

Dakin's Solution.—*Stabilization of.*—Cullen and Hubbard discuss this topic and report that the addition of 0.5 per cent. of borax, 0.5 to 1 per cent. of carbonate mixtures ($P_H = 9.5$ or 10) or 0.2 gramme sodium hydroxide per litre give satisfactory results. Sodium hydroxide should be added with extreme care, while the use of borax combines convenience and safety. The authors also describe in detail the electrolytic preparation of Dakin's solution.—J. Biol. Chem.; through Chem. Abstracts, 13 (1919), 2105.

Donovan's Solution.—*Modified Formula Containing Sodium Cacodylate.*—E. Crouzel proposes in interest of securing a more stable product, to substitute sodium cacodylate for arsenous oxide in the formula, as follows: Sodium cacodylate, 1 gramme; mercuric iodide, 1 gramme; potassium iodide, 1 gramme; distilled water, 97 grammes. If desired, a stock solution ten times stronger than this may be prepared by dissolving the above quantities of ingredients in 7 grammes of water.—Rept. Pharm.; through Pharm. J., 103 (1919), 321.

Eusol.—*Accurate Preparation of.*—E. J. Hart outlines a method for the preparation of a solution containing, when fresh, 0.45 per cent. of hypochlorous acid, which is approximately equivalent to the strength of sodium hypochlorite aimed at in Dakin's solution. The correct amount of assayed bleaching powder is mixed with half the bulk of water to be used, allowed to stand for a period of eight to twelve hours, with occasional agitation; the solution is then filtered and the filter washed with water to make up any loss in volume. The necessary quantity of boric acid is dissolved in the other half of water (filtering if necessary) and the two solutions mixed, care being taken that the solution be quite cold before mixing. The following table gives the correct amounts of bleaching powder and boric acid to be used to prepare 1 liter of Eusol:

Strength of Bleaching Powder in available Chlorine.	Quantities to be used to obtain 1 liter of Eusol containing 0.45% Hypochlorous Acid.	
	Bleaching Powder	Boric Acid.
20 per cent	15.208 grammes	9.636 grammes
21 per cent	14.484 grammes	
22 per cent	13.825 grammes	This quantity is constant for 1 liter of Eusol, irrespective of the strength of sample of bleaching powder.
23 per cent	13.224 grammes	
24 per cent	12.673 grammes	
25 per cent	12.166 grammes	
26 per cent	11.698 grammes	
27 per cent	11.265 grammes	
28 per cent	10.862 grammes	
29 per cent	10.488 grammes	
30 per cent	10.138 grammes	
31 per cent	9.811 grammes	
32 per cent	9.505 grammes	
33 per cent	9.217 grammes	
34 per cent	8.946 grammes	
35 per cent	8.690 grammes	

—Pharm. J., 103 (1919), 535. (C. P. W.)

Hypochlorite Solutions.—*Action on False Membranes of the Pleural Cavity.*—At a meeting of the Société de Thérapeutique, Caussade, Thonier and Philibert reported that three identical pleural fragments obtained in a case of purulent pleurisy were treated with diluted Labarraque's solution, diluted Javel water and Dakin's solution, all of exactly the same chlorine content. All three hypochlorite solutions dissolved the false membrane, Labarraque most quickly, Javel less so; and Dakin quite slowly; the difference in

speed being undoubtedly due to the degree of alkalinity of the three solutions. From this experiment the authors believe that neither diluted Labarraque nor diluted Javel should be introduced into the pleural cavity.—*J. pharm. chim.*, 20 (1919), 43.

Hypochlorite Solutions.—*Assay of.*—Frank X. Moerk and Ralph R. Foran suggest certain modifications in the assay of hypochlorite solutions such as Dakin's. Their suggestions are based on the following assay process for Dakin's Solution: Measure 10 mls of Dakin's solution into a beaker or Erlenmeyer flask containing 50 mls water, add 5 mls of a 10 per cent. potassium or sodium iodide solution and 2 mls of glacial acetic acid. Run in deci-normal sodium thiosulphate solution until decolorization is complete, using starch solution as indicator. The suggested changes are (1) that the prepared test be allowed to stand one hour before titrating, (2) to increase the quantity of glacial acetic acid to 3 mls for immediate titration or (3) to replace the acetic acid by a diluted hydrochloric or sulphuric acid.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 276. (R. P. F.)

Hypochlorite Solutions.—*Assay of Free Alkali and Carbonates in.*—W. Mestrezat publishes a critique of the article under the above title (See YEAR BOOK, 1918, 104) published by M. Philibert, in which he takes issue with many of Philibert's findings.—*J. pharm. Chim.*, 20 (1919), 9.

Hypochlorite Solutions.—*Assay of Free Alkali and Carbonate in.*—Philibert replies to the foregoing paper of Mestrezat, insisting that the stand taken in the Philibert paper of 1918 is correct.—*J. pharm. chim.*, 20 (1919), 52.

Javel Water.—*Stability of.*—Javel water, when kept, loses considerable quantities of active chlorine, the loss being caused principally by the action of light and Fonzes-Diacon has made a study of the course of the reaction and the conditions which may lead to its reduction to a minimum. Eight samples were exposed to the action of diffused light by putting them before a well lighted window on which direct sunlight was not falling; two were placed in flasks made of yellow glass, one of a much darker shade than the other, and the six others in white glass. The chlorine was determined at intervals of time extending over about four months,

and it was found that even in in that time the loss of chlorine in the dark yellow flask was very small; in the less deeply colored glass it was rather greater and still more marked in the white flasks. The greater the proportion of active chlorine the greater the loss, and after four months' exposure to the action of light, water which originally contained very different amounts gave results which approached a common limit. If the initial amount of active chlorine present is about 5 grammes per 100 mils, and if the extracts are kept in dark yellow flasks, they may be regarded as unaltered at the expiration of several months.—Bull. Soc. chim.; through Chem. News, 118 (1919), 275.

Lime Water and Lime Water Tablets.—It is important, R. W. Terry reminds us, that lime water should not be deficient in calcium hydroxide content. Yellow wash prepared with weak lime water is dangerous because of free mercuric chloride. Its large use in infant feeding should prevent any poor lime water ever being dispensed. A small quantity of calcium carbonate is not a serious objection, but dispensing it with undissolved calcium hydroxide is reprehensible. It is possible to obtain a good quality of lime, though some druggists still use builders lime. About 25 per cent. of the lime water sold does not meet U. S. P. requirements. Its strength is affected by temperature and by exposure to air.

Chemical analysis of some prepared limes show a high degree of purity. Those consisting of calcium hydroxide are better to use than those consisting of oxide because solution is more certain and also because of the safety in handling the tubes. The U. S. P. process for purification is effective but time-consuming. A large quantity of magma may be prepared at a time or the magma may be dried over a direct flame using the dried calcium hydroxide when needed.

Mr. Terry gives a number of tables showing the results of examination of prepared calcium oxide; comparison of lime water from commercial and prepared calcium oxide; lime water tablets; lime water prepared from lime water tablets both fresh and one year old; and lime waters purchased at retail. These tables contain much valuable information. He found starch in four out of five tablets, added to assist disintegration. Sugar was found in one and lime water prepared from it is over U. S. P. strength and liable to greater variation than the official. Calcium hydroxide was present in all in from 3 to 5 times the required amount. Lime

water from four of the tablets meets U. S. P. requirements except as to time. They are intended for extemporaneous use but fifty-four hours' time is usually necessary to saturate. Hence they cannot safely be used in less than three days.

Mr. Terry would modify Nitardy's double siphon method for dispensing—placing a test tube by use of a one-hole rubber stopper over the delivery tip to prevent formation of carbonate and consequent clouding of the next portion drawn. Rubber tubing on lime water siphons should be replaced every three months and red rubber should not be used because of the solubility of antimony.—J. Am. Pharm. Assoc., 8 (1919), 473. (Z. M. C.)

Linseed Serum.—*Use for Burns.*—A filtered and sterilized solution of 9 parts sodium chloride in 1,000 parts infusion of linseed (1.5 per cent.) constitutes a "linoserum" which is recommended by Bandalin and De Palia-Roff as an efficacious dressing for burns. It must be applied fresh the day it is prepared and to get the best results should be combined with hot air douches.—I, Union pharm.; through Am. Drug., 67 (1919), 334.

Liquor Aluminii Hypochloritis.—*Preparation and Standardization of.*—A neutral standard solution of aluminum hypochlorite may be prepared by the following method, according to R. C. Cowley: Mix 50 grammes of chlorinated lime with 500 mls of water, filter, and pass sufficient water through the filter to make 500 mls. Boil 20 mls of this solution with 10 mls of dilute hydrochloric acid and until all chlorine has been expelled. Add 2 drops of methyl orange solution and exactly neutralize with normal sodium carbonate, ignoring the amount used. Continue boiling until all carbon dioxide is expelled, and titrate with normal sodium carbonate (phenolphthalein indicator,) to a pink color, the number of mls used indicating the soluble calcium salts present in the 20 mls. Calculation from this result will show the exact equivalent amount of aluminum sulphate dissolved in 500 mls of water necessary to precipitate the calcium salts in the remainder of the lime solution. Stand until precipitation is complete, decant the clear solution, filter the remainder and estimate the hypochlorite present by titration with alkaline arsenous oxide solution, adjusting the solution to 0.5 per cent. w/v of aluminum hypochlorite.—Chem. and Drug., 91 (1919), 61. (K. S. B.)

Liquor Ammonii Acetatis Concentratus.—*Preparation of.*—F. Goldby recommends: Acetic acid (99 per cent.) 433.5 mls; ammonium carbonate, 400 grammes; distilled water to make 1000 mls.—Pharm. J., 102 (1919), 159. (C. P. W.)

R. C. Cowley criticizes the foregoing, showing by means of analytic figures how correct amounts of acetic acid and ammonium carbonate can be determined.—Pharm. J., 103 (1919), 215. (C. P. W.)

Liquor Cresolis Compositus.—W. W. Davies calls attention to the desirability of allowing the use of cheaper oils in this preparation. The germicidal value would not be altered. Statistics indicate that about 150,000 gallons of oil are used every year in compound cresol solution. In September 1918, that quantity was worth \$282,000, while the same amount of soya bean oil cost \$100,000 less. The saponification value of the two oils is so close that the proportions of the formula need not be altered. The product of the two oils is comparable in every way. Corn oil or mixtures of corn oil and soya bean oil may be used also.—J. Am. Pharm. Assoc., 8 (1919), 98. (Z. M. C.)

Liquor Magnesii Citratis.—Wilbur F. Horn suggests the following procedure for the preparation of solution of magnesium citrate. Taking the weight of magnesium carbonate given in the U. S. P., divide it into two portions of 10 and 5 grammes, respectively. Dissolve the 10 gramme portion and 28 grammes of citric acid in about 60 mls of cold water in a wide mouth bottle. Filter through cotton into a citrate bottle. Mix the 5 gramme portion with 60 mls of simple syrup in a 120 mil graduate and add sufficient water to make 120 mls. Pour into the citrate bottle and add water enough to fill. Add two drops of lemon oil and close the bottle, laying it on its side until needed. This procedure eliminates the use of sodium or potassium bicarbonate entirely and saves 7 grammes of citric acid per bottle. It is claimed that the solution is more homogeneously charged with gas and tastes better than that made by the U. S. P. process.—Proc. Penna. Pharm. Assoc., 42 (1919), 228. (R. P. F.)

Solution of Magnesium Citrate.—*Non-Effervescent.*—H. Herzfeld points out that the effervescent solution of magnesium citrate is not dispensed by prescription or sold over the counter; in fact,

it is absolutely unknown in South America. In place of it, however, a non-effervescent preparation of identical composition is extensively sold. It is called "Limonada Rogé," and the formula is as follows:

Citric acid.....	30 grammes
Carbonate of magnesia.....	18 grammes
Water.....	200 grammes
Syrup of lemon.....	50 grammes

This quantity is dispensed in an ordinary prescription bottle as one adult dose; for children the dose is proportionately less. Instead of syrup of lemon, syrup of raspberry is sometimes used.

In the pharmacies of Argentina this solution is ordered by prescription, and is also extensively sold over the counter. It is prepared fresh every second day, and in spite of the fact that it is not effervescent, it has for years given universal satisfaction. The price of "Limonada Rogé" (the regular quantity for an adult dose) is 80 centavos (about 35 cents U. S.).—Pharm. Era, 52 (1919), 48.

Liquor Plumbi Subacetatis Fortis, B. P.—*A Criticism of Assay of.*—In order to prevent the formation of a basic salt and consequent low results in the method of the British Pharmacopœia for the determination of the lead in the solution, R. L. Morris recommends that 1 gramme of the solution be diluted with 50 mls of 33 per cent. acetic acid, instead of water. In the U. S. P. IX method, the formation of this basic salt would give a higher result than the true percentage, as in this case the residual oxalic acid is titrated, instead of that in the precipitate, as in the B. P. method.—Chem. and Drug., 91 (1919), 243-4. (K. S. B.)

Liquor Sodæ Chlorinatæ, B. P.—*Criticism and Assay of.*—R. C. Cowley claims that the B. P. 1914 method of making liquor sodæ chlorinatæ contains insufficient sodium carbonate to precipitate the soluble calcium salts present, and recommends the use of one part chlorinated lime (30.6 per cent. available chlorine) to two parts of sodium carbonate. As this reaction produces excessive sodium hydroxide for wound treatment, neutralization with boric acid or sodium bicarbonate, as in Dakin's solution, is advised. As an excess of boric acid would liberate hypochlorous acid, which is less stable than alkaline hypochlorites, exact neutralization should be secured. The author estimates the amount of sodium hypochlorite and of

sodium hydroxide in one volume of the solution as follows: Determine the sodium hypochlorite present in 5 mils by titrating with N/10 alkaline (by sodium carbonate) solution of arsenic trioxide. When the determination is completed, transfer to a 100-mil flask, rinsing the dish into the flask with recently boiled water. Precipitate the carbonate by the addition of 10 mils of normal barium chloride solution and make up to 100 mils with boiled water. Stand to permit complete precipitation, and titrate 50 mils with N/10 hydrochloric acid.

Because of the variation of the available chlorine content of chlorinated lime, it is difficult to produce a neutral solution of chlorinated soda by following a set formula. Cowley has devised a method for the preparation of such a neutral solution by dissolving the chlorinated lime in water, filtering, estimating the amount of calcium compounds in solution, adding the exact amount of sodium carbonate to precipitate them, and adjusting the product to 0.5 per cent. sodium hypochlorite. He proceeds in the following manner: Triturate 50 grammes of chlorinated lime with 500 mils of water, transfer to a bottle, shake well from time to time, and stand for 12 hours. Filter and pass enough water through the filter to make 500 mils. Dissolve 200 grammes of crystallized sodium carbonate in sufficient water to make 1000 mils. Boil 20 mils of the lime solution with 10 mils of dilute hydrochloric acid until all the chlorine has been expelled, add two drops of methyl orange as indicator and exactly neutralize with sodium carbonate solution, ignoring the amount used. Boil until the carbon dioxide is expelled, add a few drops of phenolphthalein solution and sufficient of the sodium carbonate solution to produce a pink color. This latter amount of sodium carbonate solution represents the amount required to precipitate the soluble calcium compounds in 20 mils of lime solution. From this is calculated the quantity necessary for the remaining 480 mils, add, let the liquid stand until the precipitate has subsided, decant the clear portion, and filter the remainder, passing some water through the filter. Determine the amount of sodium hypochlorite present by the alkaline arsenic trioxide method and adjust to 0.5 per cent. *w/v*. The quantity of free alkali present is negligible. The solution is hypertonic, being about 7.5 times isotonic. While it would likely be suitable, when diluted 1 to 7.5, for treatment of aseptic wounds, it would probably not have sufficient germicidal action to render a wound aseptic.—Chem. and Drug., 91 (1919), 61. (K. S. B.)

Mandl's Solution.—Otto Raubenheimer points out that this preparation has the following recipe:

PIGMENTUM IODI COMPOSITUM.

Compound Iodine Paint.

(Mandl's Solution).

Iodine.....	1.25 grammes
Potassium iodide.....	5.50 grammes
Oil of peppermint.....	0.75 mils
Glycerin.....	enough

Used as an antiseptic and stimulant application for the throat.
—Drug. Circ., 63 (1919), 233.

Solution of Iron Caseinate.—*Manufacture of.*—E. Artl first makes a 2.5 per cent. solution of fat-free caseine by treating 25 grammes of dry caseine, or the proportional amount of fresh unsalted curd, or 0.8 kilo of skimmed milk with enough water to make 900 mils, then adding a trace of phenolphthalein and enough solution of sodium hydroxide to make a faint red fluid and, lastly, enough water to make 1 kilo of solution. What butter fat remains in the fluid can be shaken out with chloroform. This cloudy solution will keep for weeks and from it iron caseinate is made by adding 400 grammes of it to a mixture of 120 grammes of solution of ferric chloride (Pharm. Germ.) and 80 grammes of water. The precipitated caseinate is washed free from chlorides and is mixed with 30 grammes of sugar, 1.2 grammes of lactic, tartaric or citric acid and after one-half hour the mixture is dissolved by adding 8 grammes of 15 per cent. sodium hydroxide solution, 100 grammes of alcohol, 100 grammes of cinnamon water, 2 grammes of aromatic tincture and water enough to make 1 kilo.—Apoth.-Ztg.; through Chem. Abstracts, 13 (1919), 2965.

Solution of Mercury Benzoate.—*For Injections.*—E. Leger discusses the use of mercury benzoate in syphilis, as well as the attempts to prepare a solution for injection, citing the work of Gaucher, Varet, Désesquelle, Rupp and Hermann, and Delépine, both in devising injectable solutions and in studying the composition of those prepared. Mercury benzoate is insoluble in water but will dissolve in sodium chloride solution and previous research has shown (see YEAR BOOK, 1914, 500) that

such preparations are merely mixtures of mercuric chloride with sodium benzoate.

Leger suggests the following recipe in which he claims the mercury is present as chloromercurate of sodium.

Mercuric chloride.....	0.60 gramme
Sodium chloride.....	2.25 grammes
Sodium benzoate.....	0.70 gramme
Distilled water, to make.....	100 mils

Dissolve the mixture of salts in 25 mils water by agitation, then add water to make 100 mils and then filter.—J. pharm. chim., 20 (1919), 145.

Solution Phenosalicyl.—This preparation, recommended as an antiseptic by Dr. Christmar, consists of 190 parts of phenol, 20 parts of salicylic acid, 40 parts of lactic acid, 1 part of menthol, 4 parts of eucalyptol, 40 parts of lemon oil and 540 parts of distilled water.—Pharm. Weekblad, 56 (1919), 1616. (H. E.)

Solution of Sodium Cacodylate and Strychnine Sulphate.—*Preparation for Ampuls.*—As this solution placed in ampuls, was found to become turbid, it is recommended to prepare the solution from 0.5 gramme of sodium cacodylate, 0.02 gramme of strychnine sulphate, 4 grammes of alcohol, 2 grammes of glycerin to make 10 mils.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Solution of Sodium Hypochlorite.—*Manufacture of.*—Ebert finds sodium sulphate a better precipitant in this preparation than sodium carbonate. He recommends the following recipe: Triturate 20 parts of chlorinated lime with 100 parts of water, add a solution of 28 parts of sodium sulphate in 500 parts of water. Let stand and syphon off the clear solution.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 1619.

LOTIONES.

Eau Dentifrice du Dr. Pierre.—This may be prepared from 100 parts of oil of star-anise, 3 parts of oil of cloves, 60 parts of oil of peppermint, 2 parts of oil of rose, 100 parts of tincture of benzoin, 100 parts of tincture of cochineal, 250 parts of sandalwood, 8500

parts of alcohol and 1000 parts of distilled water.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Eau des Jacobins.—This may be prepared from 5 parts of cinnamon bark, 5 parts of sandalwood, 4 parts of red saunders, 4 parts of anise seed, 4 parts of juniper seed, 2 parts of cochineal, 3 parts of angelica seed, 1 part of galanga root, 1 part of aloes, 1.5 parts of cloves, 1.5 parts of mace and 1000 mls of 80 per cent. alcohol; the ingredients are allowed to macerate for two weeks and the liquid is then filtered.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Mouth Wash.—Fleissig gives the following formula as a substitute for eau de Botot, which is used as a mouth-wash at the Basle Hospital:

Solution of aluminium aceto-tartrate.....	100
Water.....	1000
Tincture of cochineal.....	20
Menthol (dissolved in alcohol 3).....	1
Ol. menth.....	2
Saccharin.....	q. s.

—Schweiz. Apoth. Ztg.; through Chem. and Drug., 91 (1919), 1122.

MISTURA.

Castellani's Mixture.—This, according to Guerrero, has the following formula:

Antimony and potassium tartrate.....	0.065 gramme
Sodium salicylate.....	0.65 gramme
Potassium iodide.....	4.00 grammes
Sodium bicarbonate.....	1.00 gramme
Water, to make.....	30.00 grammes

This is given for yaws in a single dose diluted with 120 mls of water, to mature adults. To Europeans, half the dose is given, and to children one-third or less.—Philipp. J. Sci.; through Am. J. Pharm., 91 (1919), 316.

Mistura Copaibæ.—*Preparation of.*—I. E. Bortnicker suggests the following method of compounding mistura copaibæ and states

that a uniformly well made preparation results: Use one-half as much acacia as balsam and twice as much water as acacia and balsam combined and make an emulsion. The solution of potassium hydroxide compound, spirit of lavender, sweet spirit of nitre and syrup are mixed together and gradually added to the emulsion. The surplus of acacia called for in the formula is made into a mucilage and added to the finished product, lastly straining the preparation. This method is far superior to, although a little more troublesome than, the official one.—Am. Drug., 67 (1919), 573. (C. P. W.)

OLEATA.

Oleate of Proflavine.—*Use as Wound Dressing.*—Berkeley and Bonney discuss the value of proflavine oleate in war wounds and describes methods of application. No recipes are given.—Brit. Med. J.; through Am. J. Pharm., 91 (1919), 318.

OLEORESINÆ.

Oleoresins.—*Historical Bibliography.*—In a thesis of 288 pages, A. G. DuMez presents a comprehensive review of that class of preparations called oleoresins. The pamphlet is one of the most complete bibliographies of a pharmaceutical subject ever published.—Univ. Wis. Bulletin No. 980.

PASTÆ.

Bipp Paste.—C. H. Willans states that Morison's present recipe for this paste is: Iodoform, 16 oz.; bismuth subnitrate, 8 oz.; liquid petrolatum, 8 fl. oz., or a sufficient quantity. The powders are mixed together in a mortar, and the liquid petrolatum incorporated. The quantity of liquid petrolatum required varies according to the bulk of the powders, the bismuth in particular being liable to a considerable variation in bulk. A sufficient quantity should be added to form a paste. It is then advisable to rub down the paste, in small quantities at a time, on a slab with a spatula, to ensure freedom from grit and dry particles of powder.—Pharm. J., 103 (1919), 179.

Dreuw's Paste.—Otto Raubenheimer directs attention to the fact that many formulas have been published for this preparation

and gives the following formula which was furnished him by a physician who studied dermatology under Professor Dreuw:

Salicylic acid.....	10 grammes
Oil of Birch Tar.....	20 grammes
Chrysarobin.....	20 grammes
Wool Fat.....	25 grammes
Soft Soap.....	25 grammes

Dispensing difficulty is due to action of salicylic acid on soft soap. To overcome this, "Incorporate the finely powdered salicylic acid with the oil of birch tar and then gradually mix in the chrysarobin. Mix the wool fat and soft soap." Finally combine the two mixtures and dispense in a jar or wide mouth bottle. This was called "Vienna Paste" by some New York physicians but it is important to remember "Vienna Paste" is a synonym for Potassa cum Calce, N. F., a preparation which is very caustic.—J. Am. Pharm. Assoc., 8 (1919), 959. (Z. M. C.)

Tooth Pastes.—*Bacteriological and Microscopic Study of.*—R. C. Root reports a study of some of the popular brands of tooth paste which he made for the purpose of determining the value of their antiseptic ingredients in destroying the bacteria of the mouth, and also to determine the character of the abrasive used and its probable action on the enamel of the teeth. The method of determining the number of bacteria in the mouth before and after brushing the teeth with a sample tooth paste is explained, the same method being used also with a paste containing no antiseptics. The toothbrush was sterilized just before use each time and sterile water was used for rinsing the mouth. Each sample was used in turn and the results tabulated. No attempt was made to determine the kind of bacteria in the mouth, as the object was to determine the number of organisms, if any, destroyed by the antiseptics in addition to those removed mechanically. From the tests made it was concluded that by cleaning the teeth with a brush and tooth paste the number of bacteria in the mouth may be reduced about 50 per cent., but that most if not all of these bacteria are removed by the mechanical action of the brush and the rinsing, rather than by any antiseptic in the paste. However, as the ordinary tooth brush is loaded with bacteria, there seems to be no doubt that an antiseptic paste will aid in bettering this condition, and will render the mouth, for a short time only, a less

favorable medium for the growth and multiplication of bacteria. For the microscopical work the abrasive substance was separated from all soluble material, a water mount made of the insoluble material, examined by the microscope and several slides made and the crystals measured. The conclusion was reached that none of the five samples examined possessed any appreciable amount of objectionable gritty matter.—Bull. Mass. Coll. Pharm.; through Pharm. Era, 52 (1919), 149.

Wound Paste.—For ulcerated wounds, Morlet has devised the following paste:

Balsam of Peru.....	20 gramme.
Bismuth subnitrate.....	20 grammes
Fish glue.....	50 grammes
Glycerin.....	50 grammes
Water.....	100 grammes

The article gives into details as to application.—Presse méd.; through Am. J. Pharm., 91 (1919), 317.

"X. Y. Z." Paste.—Morison recommends the following wound paste:

Xeroform, ammoniated mercury, of each, equal parts; liquid petrolatum, enough to make a paste.—The Prescriber; through Am. J. Pharm., 91 (1919), 126.

PILULÆ.

Corrosive Sublimate Pills.—*Permanent and Resorbable.*—Make an excipient of 1 gramme of powdered tragacanth and 1 gramme of powdered acacia in 10 grammes of warm glycerin, and to 3.2 grammes of this add 1 gramme of mercuric chloride, 1 gramme of powdered opium and 5 grammes of powdered glycyrrhiza. Mass and divide into 100 pills. In this colloidal mixture, it is claimed that the bichloride is brought into solution gradually without irritating the stomach or intestines. [It should be noted that each pill contains a large dose of mercuric chloride, 1 centigramme.—Ed.]—L'Union pharm.; through Chem. Abstracts, 13 (1919), 633.

Pilulæ Antineuralgicæ Trusseau.—One hundred of these pills are said to contain 1.25 grammes of extract of opium and extract

of stramonium and 20 grammes of zinc oxide.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Silver Nitrate Pills.—*Preparation.*—These can be satisfactorily made by taking 1 gramme of silver nitrate, 0.3 gramme of powdered tragacanth, 10 grammes of bolus alba and glycerin enough to make 100 pills. Use talcum as dusting powder.—Pharm. Zent.; through Chem. Abstracts, 13 (1919), 1619.

PULVERES.

Dusting Powders.—*Efficiency of.*—The value of so-called dusting powders is dependent primarily on their capacity for absorbing and retaining excessive fluid, for example, from the skin, from open wounds, from the intestine in dysentery, etc. To determine the value of the different materials used for the purpose, T. Sollmann determined the approximate percentage of water which is absorbed by them. He finds that the commonly used substances do not differ materially in their capacity to hold water. However, starch, kaolin and fullers earth are more effective than chalk or talcum.—J. Am. Med. Assoc., 72 (1919), 935. (W. A. P.)

A. B. C. Powder.—At Bellevue Hospital, this name is given to a mixture of equal parts of boric acid, bismuth subnitrate and calomel.—Drug. Circ., 63 (1919), 62.

Pulvis Inspersorius Anderson.—This is said to consist of 6 parts of camphor, 80 parts of wheat starch and 14 parts of zinc oxide.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Pulvis Sternutatorius.—This is a snuff which is prepared from 2 parts of powdered marjoram, 26 parts of powdered orris root, 4 parts of boric acid and 0.3 part powdered white hellebore.—Pharm. Weekblad, 56 (1919), 1615. (H. E.)

RESINÆ.

Resin of Man-Root.—The supply of purgatives derived from Convolvulaceæ was much disturbed by the war and consequently there has been new interest in substitutes. E. E. Stanford and C. O. Ewing found that only two plants of this family, in the United

States, were available in quantity: *Ipomæa pandurata*, a plant indigenous to southern Atlantic and Gulf states; and *Ipomæa batatas*, the common sweet potato. The former was known to possess purgative properties, but nothing in literature indicated that sweet potatoes had been found to have similar properties. The paper gives a detailed description of the methods of extracting the roots with several organic solvents. Some extractions of the root of yellow morning glory were made also. The resins obtained were found to be complex in composition, partly glucosidal in nature. Only the man-root resin seemed to possess marked physiological action, and it was cathartic. Because it is mild in action and hygroscopic it is not probable that it will become a competitor of scammony, jalap or orizaba resin.—J. Am. Pharm. Assoc., 8 (1919), 789. (Z. M. C.)

SAPONES.

Soap.—*Composition of a German Sample.*—Examination of a sample of German toilet soap purchased in Cologne showed that it consisted of 70.98 per cent. kaolin, 16 per cent. moisture, and the balance true soap. It was grayish brown in color, hard and difficult to cut, perfumed with methyl salicylate, and lathered feebly, although it possesses good cleansing properties.—Chem. and Drug., 91 (1919), 101. (K. S. B.)

Soaps.—*Proposed Changes in Official.*—E. V. Kyser reminds us that the use of soap should determine its composition, and that ingredients and methods of the U. S. P. are not economical and do not yield the best products. He tells why the present soap and soft soap are not the best and gives detailed specifications for soaps to take their place. He makes suggestions also for the formulas of preparations containing these soaps as well as for changes in formulas of lime liniment and compound cresol solution.—J. Am. Pharm. Assoc., 8 (1919), 813. (Z. M. C.)

Antiseptic Soaps.—*Germicidal Value of.*—J. C. Wildman reports the results of an examination of soaps purchased in the open market in the original packages under the label of the manufacturer. To determine their germicidal powers the phenol coefficient, Hygienic Laboratory method, was used, with some necessary modifications. The figure that represents the ratio of the germ-

icidal power of a soap to the germicidal power of carbolic acid, both tested under the same conditions, may be called the coefficient of the soap. The phenol coefficient of each sample was determined without the addition of organic matter; when a soap showed a phenol coefficient of less than one, without organic matter, its germicidal efficiency was so low that it was considered a waste of time and material to test it with organic matter. Complete tests were made for three samples only, an "antiseptic soap," a "germicidal soap," and a "tincture of green soap." It was found that the coefficient of the "tincture of green soap" was greater than that of the "antiseptic soap," but that of the "germicidal soap," which contained 1 per cent. of mercuric iodide in combination, was slightly greater than either of the others, so that this seems to be the best combination for an antiseptic soap. But all three had a coefficient of less than 0.75 without organic matter, which shows that their germicidal value is very low, so the author concludes that U. S. P. tincture of green soap, used with hot water and a stiff brush, will be as efficient as the so-called germicidal soaps, while the cost will be much less.—Bull. Mass. Coll. Pharm.; through Pharm. Era, 52 (1919), 123.

Iodine Soap.—This medicated soap, as recognized in the Swedish Pharmacopœia is prepared by working 7 grammes of iodine into 73 grammes of soap. N. O. Engfeldt finds scarcely any free iodine in the freshly prepared soap, the element being combined with the unsaturated fatty acids. In some old soaps, as much as 4.7 per cent. of the iodine was found in the free state. The glycerin in the soap has no influence on the state of the iodine. In the official Swedish preparations, *jodi vasolinimentum*, *olementum jodi* and *oleogenum jodi*, the iodine is mostly in the form of ammonium iodide.—Svensk. Farm. Tidskrift; through Chem. Abstracts, 13 (1919), 498.

Liquid Soap.—John K. Thum submits the following formula for a liquid soap that has been found very satisfactory for general use:

Potassium hydroxide.....	200.00 grammes
Sodium hydroxide.....	700.00 grammes
Cottonseed oil.....	8,000.00 mls
Alcohol.....	3,000.00 mls
Distilled water to make.....	50,000.00 mls

Dissolve the hydroxides in 1,200 mils of distilled water, add all of the oil and 2,000 mils of alcohol; stir constantly until saponification has taken place, then add the remainder of the alcohol and sufficient distilled water to make required volume. The oil and part of the alcohol must be added immediately after the hydroxides have gone into solution. A large iron kettle, deep and spacious holding 25,000 mils is best for the preparation of this product.—Proc. Penna. Pharm. Assoc., 42 (1919), 274. (R. P. F.)

Sapo Mollis.—Bertha Mueller says that it is inconceivable just why the technic for making this soap should be so cumbersome and impractical, especially when one remembers that the making of soap is a very simple matter. It is, or should be, a matter of common knowledge that the use of artificial heat is not needed in its preparation, and certainly not when alcohol is part of the formula. She suggests the concentration of the potash solution, the addition of all the oil to it in a suitable vessel, followed by the alcohol. It should then be stirred until saponification has taken place. When clear the rest of the water is added with more or less stirring until it has all been absorbed. To stop in the midst of the making of this soap, as suggested by the pharmacopœia, in order to make an assay is unnecessary, for the book directs that the percentage of the potash should be known beforehand and the oil calculated accordingly. She makes the point that if the operator is careful in weighing these ingredients there must be a proper outcome so far as alkalinity is concerned.—Am. J. Pharm., 91 (1919), 280. (J. K. T.)

Sapo Picis Liquidus.—The three following recipes are suggested:

(1) Use 15 parts of potassium carbonate, 15 parts of ammonia water, 31 parts of borax, 1000 parts of water, 750 parts of alcohol and 30 parts of anthrasol.

(2) Use 24 parts of coconut oil, 16 parts of castor oil, 20 parts of liquid tar, 18 parts of caustic potash solution (sp. gr. 1.53), 10 parts of glycerin and 15 parts of alcohol.

(3) Use 3 parts of volatile oil of fir, 200 parts of olein, 180 parts of potassium hydroxide solution (sp. gr. 1.18), 100 parts of glycerin and enough 50 per cent. alcohol to make 1000 parts.—Pharm. Weekblad, 56 (1919), 1615. (H. E.)

SPECIES.

Species Anticystiticæ.—These contain 49 parts of uva ursi, 49 parts of couch grass and 1 part of belladonna leaves.—Pharm. Weekblad, 56 (1919), 1616. (H. E.)

Species Carminativæ.—These contain equal parts of peppermint leaves, elder flowers, linden flowers, chamomile flowers and valerian root.—Pharm. Weekblad, 56 (1919), 1616. (H. E.)

Species Nervinæ Heimii.—These contain 40 parts of valerian root, 40 parts of buckbean leaves and 20 parts of peppermint leaves.—Pharm. Weekblad, 56 (1919), 1616. (H. E.)

Species Pectorales Weka.—These contain 50 parts of peony flowers, 50 parts of fennel seed, 25 parts of blue flag root, 220 parts of couch grass and 200 parts of marshmallow root.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Species Stomachicæ.—These contain equal parts of century herb, valerian root and Roman chamomile flowers.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

SPIRITUS.

Spirit of Camphor.—*Assay of.*—Utz states that the quantities of camphor and alcohol in a sample of spirits of camphor may be found by determining the specific gravity and refractive index of the sample. The refractive index of camphor is 1.4535–1.4537 at 20° C., and the specific gravity 0.9960 at 15° C.; these values are the same for both synthetic and natural camphor. From the data obtained for the sample under examination the percentages of camphor and alcohol are ascertained by reference to a graph constructed from the results obtained with solutions of known composition.—Pharm. Zent.; through J. Soc. Chem. Ind., 38 (1919), 923 A.

Spirit of Camphor.—*Assay without a Polariscopes.*—J. Pinkhof has determined the density of mixtures of camphor and alcohol and the amount of water necessary to precipitate the camphor from such solutions and from these data he has constructed graphs and

a numerical table, which can be utilized for the assay of samples of unknown strength.—Pharm. Weekblad; through Chem. Abstracts, 13 (1919), 55.

Spirit of Nitrous Ether.—*Gasometric Assay of.*—Frerichs and Mannheim suggest the use of a burette in lieu of the usual Curtmann nitrometer in the assay of spirit of nitrous ether.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1515.

Spirit of Peppermint.—E. F. Kelly thinks it has not been generally known that the U. S. P. recognizes Essence of Peppermint as an official synonym for the spirit. Some dealers have marketed an off strength "Essence" thinking they were not amenable. Furthermore the U. S. P. does not direct that in making spirit of peppermint, it should be brought up to a definite volume after filtration. This same thing is true of spirit of spearmint and aromatic spirit of ammonia and is probably an oversight. Careful examination of the U. S. P. spirit of peppermint shows 10.6 per cent. of oil instead of 10 per cent. and this is due to loss in volume by filtration and otherwise in its preparation and checks with the 6 per cent. loss in volume found by several experiments. It is important that official formulas be brought to definite finished quantity in order to avoid all question of legal standard.—J. Am. Pharm. Assoc., 8 (1919), 115. (Z. M. C.)

SUCCI.

Fruit Juices.—*Antiscorbutic Properties of.*—Harden and Robison found that orange juice evaporated under 40° C. at reduced pressure gave a solid residue having marked antiscorbutic properties and holding same for six months. Apple jelly prepared in a Kestner evaporator was also highly antiscorbutic but not as much so as evaporated orange juice.—J. Army Med. Corps.; through Chem. Abstracts, 13 (1919), 2067.

Fruit Juices.—*Growing Vogue of.*—Fruit juices are rapidly finding their way into the daily life of the American people. A few years ago they were limited to the delicacies of the home or to syrups of the soda fountain. Today orange juice, and grape juice in particular, have found a widespread and growing popularity as agreeable beverages. It is scarcely an exaggeration to say, as does

one of the large manufacturing companies in advertising its product, that grape juice has become a national drink. The temperance wave that has swept over this country, taken in conjunction with a vigorous and effective advertising campaign on the part of various producers, has helped to secure favor for a refreshing and wholesome beverage. The recent shortage of sugar and the prospect of a necessary restriction in the output of syrups and similar "essentials" of the soft drink industry increased still further the use of palatable fruit juices. In addition to organic acids, which lend a tart flavor to them, these beverages, provided directly by nature, contain a considerable portion of sugars, which lend a food value to the product. Thus a glassful of grape juice measuring seven ounces (210 mls), will furnish about 200 calories in the form of sugar; and orange juice is about half as rich in food value. Recently the juice of the loganberry has begun to claim recognition in this category. Analyses made at the Oregon State College of Agriculture at Corvallis indicate that this fluid likewise contains from six to eight per cent. of sugar in the acid juice. This lends to its fuel value of approximately 300 calories to the liter, presumably in the form of available carbohydrates.—J. Am. Med. Assoc., through Drug. Circ., 63 (1919), 168.

Lemon Juice.—*Antiscorbutic Factor in.*—Harden and Zilva treated fresh lemon juice with an excess of precipitated chalk and then added 2 volumes of absolute alcohol and filtered the mixture, thus removing the citric acid as calcium citrate. The filtrate upon evaporation in vacuo gave a residue that was anti-scorbutically active, when administered to a monkey having the scurvy.—Biochem. J.; through Chem. Abstracts, 13 (1919), 1492.

Lemon Juice.—*Preparation of Stable.*—Strain any convenient quantity of expressed juice through a cloth and then mix the liquid with about one-fourth its volume of powdered talc and shake for about fifteen minutes. Then place aside for half an hour. Next shake again for a few minutes and once more let stand, after which filter through paper, add 10 per cent. of sugar to the filtrate and bring to a boil.

During this time place the bottles to receive the juice in a kettle of water, fill them with water and boil them in the kettle. Empty the bottles, pour in the boiling lemon juice as quickly as possible

and close up at once with a good cork previously dipped in paraffin. Juice prepared in this manner is said to possess unlimited keeping qualities.—Conf. J.; through Pract. Drug., May 1919, 60.

Lime Juice.—*Grenada Exports.*—During 1917 Grenada exported 104,617 gals., of raw lime juice and 5,650 gals. of concentrated juice, against 150,525 gals. and 7,500 gals. respectively in 1916.—Chem. and Drug., 91 (1919), 307. (K. S. B.)

Orange Juice.—*Desiccated.*—Givens and McClugage say that orange juice can be dried so that it retains a significant amount of antiscorbutic vitamin. The most satisfactory process for drying the juice is the one in which the temperature of drying is not unduly high and the duration of drying is very short. If the juice is submitted to a temperature of from 55° to 60° C. for forty hours or more, a part of the antiscorbutic vitamin is destroyed. The dried orange juice investigated by the authors was active after three months storage. It is suggested that it will serve as a convenient antiscorbutic for use in infant feeding, on polar expeditions, in the army and navy. Recognizing the need of an antiscorbutic that shall be within the reach of the poorer classes, the authors point out that by desiccation of orange juice it should be possible to save a large amount of fruit product hitherto wasted through the inability to market and sell oranges at the moment that they are ready for sale.—Am. J. Dis. Child.; through Drug. Circ., 63 (1919), 503.

Rhubarb Juice.—*Composition of.*—A. A. Besson obtained the following results on the analysis of seven samples of rhubarb juice: Total solids, 23.45 to 35.25; reducing substances, 4.5 to 12.7; ash, 4.1 to 6.9; ammonia-nitrogen, 0.13 to 0.45; protein-nitrogen, 0.05 to 0.22; oxalic acid, 2.11 to 3.53; tannin, 0.06 to 0.38 gramme per liter; total acidity, 154.5 to 222.0 mils; alkalinity of ash 42.0 to 82.8 mils; and free organic acids 150.4 to 217.3 mils of N 1 solution.—Chem. Ztg.; through Pharm. Era, 52 (1919), 99.

SUPPOSITORIES.

Molded Suppositories.—*Substitute for Oil of Theobroma in.*—L. Behrbalk uses a mixture of 1 part of spermaceti and 3 parts of olive oil. This mixture melts at 37.2°.—Pharm. Post; through Chem. Abstracts, 13 (1919), 767.

Suppositories.—*Fat Free.*—In order to economize in cacao butter H. Terry recommends preparing a suppository mass from a decoction of Irish moss and washed sterilized bolus, and incorporating into this mass the desired medicament. The suppositories should be moistened with water before being used.—Apoth. Zeit.; through Pharm. Weekblad, 56 (1919), 192. (H. E.)

SYRUPI.

Syrup of Iodotannin, N. F.—*Assay Process.*—George Éwe recommends the following method of assay: To a 50 mil sample in a 300 mil Erlenmeyer flask add 100 mls water and exactly 20 mls N/10 silver nitrates V. S. Add 20 mls nitric acid and heat just barely to boiling. Add 10 mls of ferric-ammonium sulphate test solution and allow to cool. Titrate back with N/10 potassium sulphocyanides V. S.—Proc. Penna. Pharm. Assoc., 42 (1919), 175. (R. P. F.)

Syrup of Iodotannin.—*Preparation.*—F. Brémen dissolves 4 grammes of tannin in 20 grammes of tincture of iodine, adds 200 grammes of syrup, boils with reflux condenser until all of the iodine combines and upon cooling adds sufficient syrup to make 1000 grammes. Commenting on this, "J. G. G." prefers a modification of the French Codex recipe, while "X" recommends Mansier's process.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 1370.

TABLETTÆ.

Tablets.—*Assay of.*—F. Richard gives explicit directions for the assay of compressed tablets, including moisture, excipient and ash, as well as the patent ingredient. The article contains tabulated data on the assay of 12 batches of antipyrine tablets, 12 batches of aspirin tablets and 12 batches of quinine hydrochloride tablets.—J. pharm. chim., 19 (1919), 5.

Tablets of Phenolphthalein.—*Examination of.*—M. Bouvert reports his experiences with these tablets, giving method of analysis, composition of the average phenolphthalein tablets of commerce and a list of phenolphthalein derivatives that may be present in tablets. He inclines to the belief that clinical experimentation is more valuable than analytical data in establishing the medical efficiency of these tablets. Bull. sci. pharmacol.; through Chem. Abstracts, 13 (1919), 2104.

TINCTURÆ.

Tinctures.—*Differentiation from Dialysates.*—In France, besides tinctures, stabilized preparations, "*intraits*" and dialysates of drugs are used. R. Chodat points out that while there are no oxidizing enzymes in tinctures and "*intraits*," there are present in dialysates and the latter can be distinguished from tinctures by their reaction with a fresh tincture of guaiac and 1 per cent. hydrogen dioxide.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 1743.

Tinctures.—*Preparation of.*—Bodinus states that of the 41 tinctures of the German Pharmacopœia, 24 are susceptible to improvement. He then gives his views as to the preparation of the 24, which he thinks should be prepared by treating the drug with boiling water, cooling to 40°, adding diluted alcohol, macerating 4 days, expressing and lastly filtering after another 4 days' maceration. The article also gives details as to special manipulations required in making some of the tinctures in the list.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2966.

Tinctures.—*Preparation from Fluidextracts.*—Such procedure may be permissible when the alcoholic strength is the same, as with the tincture and fluidextract of cannabis or with the tincture and fluidextract of aconite where the percentage of alcohol is 66½ and 71 per cent., respectively, and the activity due to alkaloidal content, but E. D. Davy shows by a few other examples how reprehensible the practice often is. The menstruum of fluidextract of cinchona contains hydrochloric acid and the tincture does not. Dilution of the former would give a tincture with hydrochlorides of the alkaloids instead of salts of the organic acids. Fluidextract of belladonna has a 76 per cent. menstruum but the tincture has about 49 per cent. of alcohol. A heavy precipitate results unless the alcohol approximately 76 per cent. strong is used but then the tincture is different from the official one. The tincture and fluidextract of rhubarb shows a similar difference in alcoholic strength and consequent precipitation on dilution. Tincture and infusion of digitalis have been commonly prepared from fluidextract in spite of the loss of efficiency with age. Since the official infusion contains no alcohol it is evident that it is intended to be freshly prepared. Fluidextracts are the best concentrated preparations now available but

when diluted they do not represent other preparations. Twenty official tinctures depend in part or altogether on alkaloids for activity, thirty-two have active principles that are glucosides, resins, oils or acids. Most of these will show a precipitate when made from fluidextracts except where there is no change in menstrua and it remains to be proven whether this precipitate is inactive where the activity of the drug is due to gums, resins or glucosides. Many fluidextracts are nearly saturated solutions while most tinctures represent ten per cent. of the drug.—J. Am. Pharm. Assoc., 8 (1919), 112. (Z. M. C.)

Tincture of Cantharides.—*Preparation of.*—F. W. Nitardy reports that none of the tinctures of cantharides made by five well-known pharmaceutical houses showed vesicating properties. Acting upon a suggestion of Dr. E. R. Squibb made in 1871 (Proceedings A. Ph. A., 19, 457) he prepared a tincture that produced a blister in six hours and which apparently is stable. It is miscible with diluted alcohol and neutral to litmus, desirable properties when the tincture is to be used in hair tonics. Following is the formula:

Cantharides in No. 60 powder.....	100 grammes
Potassium hydroxide.....	6.8 grammes
Alcohol 7 volumes } Sufficient quantity.....	
Water 3 volumes }	
To make 1000 mils	

Dissolve the potassium hydroxide in 300 mils of water and add it to the powdered cantharides. Mix well, then add 700 mils of alcohol and place the mixture in a well-covered container. Allow to macerate for one week, stirring daily. Transfer it to a percolator which has previously been stoppered and after the drug has settled allow to percolate until all the tincture has drained from the drug. Then continue percolation with a menstruum consisting of alcohol 7 volumes, water 3 volumes until a total of 1000 mils of tincture has been obtained.—J. Am. Pharm. Assoc., 8 (1919), 1030. (Z. M. C.)

Tincture of Colchicum Seed.—*Improved Method of Assay.*—M. E. Webber suggests a modified method for the assay of tincture of colchicum seed which he says will eliminate two possible chances of error in the U. S. P. IX method.—Meyer Bros. Drug., Oct., 1919, 5. (C. M. S.)

Compound Tincture of Benzoin.—*An Experiment with.*—The report that true storax was unobtainable led J. C. and B. L. DeG. Peacock to make some experiments on compound tincture of benzoïn and on tolu and storax with reference to the products of vaporization from boiling water. They attempted to imitate the conditions existing in a treatment for throat affections through use of retort and condenser. The seven fractions collected from the compound tincture were colorless but slightly turbid, equally acid to litmus, odor and taste true to source. The residue in the retort showed a marked acidity. Distillation of the solid ingredients together gave fractions with varying odors but colorless and transparent and acid to litmus. Small droplets of a liquid present to the same extent in the different fractions, totalled less than 0.5 mil from the ingredients for 100 mils of tincture. Coalescence of the droplets could not be induced so shaking out with ether was resorted to. The ethereal residue was readily soluble in alcohol yielding a pale amber-colored oily substance and small white granular crystals. Treatment with dilute solution of sodium hydroxide to remove benzoic acid gave the oily portion a buttery consistence and cold water had the same effect but it was not soluble in a 5 per cent. sodium hydroxide solution. The crystals gave tests for benzoic and cinnamic acids. Individual ingredients were distilled alone, each yielding uniform fractions, all colorless, with odor and taste of the original. There was great similarity in the products of distillation from tolu and storax except that the former was acid to litmus and showed traces of benzoic acid. The distillate in quantity was twice that from storax. It is evident that none of the ingredients are exhausted in the time consumed in a treatment. Temperature should be sufficient to produce slight ebullition to insure carrying the ascending vapor into the throat. Aloes might be omitted without loss of activity. Benzoïn furnishes little beside benzoic acid and storax might be omitted. Tincture of benzoïn 2.5 mils, tincture of tolu 2 mils and alcohol to make 5 mils might be used in place of the same volume of compound tincture of benzoïn; or, benzoïn 0.5 gramme and tolu 0.4 gramme in place of the above, though alcohol serves the purpose of distributing the materials on the water. Another suggestion is to use benzoic acid 0.63 gramme and tolu 4 grammes in place of either formula (the amount of benzoic acid based on official requirement of 12.5 per cent. in benzoïn). The authors believe also that tincture of tolu is just as effective for vaporization.—J. Am. Pharm. Assoc., 8 (1919), 482. (Z. M. C.)

Compound Tincture of Cinchona.—*Note on.*—The U. S. P. directs this tincture to be made by percolating definite amounts of red cinchona, bitter orange and serpentaria with alcohol, glycerin and water, but assays for cinchona alkaloids. F. W. Nitardy calls attention to the fact that the finished tincture may assay 50 per cent. above U. S. P. requirement and adjustment reduces the proportion of bitter orange, serpentaria and glycerin materially and prevents uniformity in different lots of compound tincture. He suggests making the tincture in two portions, "the first representing one-half of the volume of the finished tincture and containing all of the bitter orange peel and serpentaria, the other representing the red cinchona adjusted to proper strength (double that of the compound tincture) and these mixed in equal volumes, would produce a product that would be more nearly uniform" than the present official method.—J. Am. Pharm. Assoc., 8 (1919), 114. (Z. M. C.)

Tincture of Digitalis.—*Preparation of.*—Joachimoglu finds that tincture of digitalis made with absolute or with 69 per cent. alcohol were equally active, but it was found that only 75 per cent. of the active substances were extracted from the leaves by the percolation process. After four months no loss in activity was noticed, but after 11 months the activity had decreased, which, the author believes, was due to a high summer temperature, because experiments had shown that high temperatures decrease the activity of digitalis preparations considerably. Light appears to exert only a slight influence on the activity.—Ber. dtsh. pharm. Ges.; through Drug. Circ., 63 (1919), 444.

Tincture of Ginger.—*Menstruum for.*—To determine whether alcohol of less than 95 per cent. could be used successfully in the preparation of Tincture of Ginger, L. J. Lipman and George Éwe experimented with 85 per cent., 75 per cent., 65 per cent., and 55 per cent. alcohol in addition to 95 per cent. The tinctures were all prepared by maceration, to insure uniformity, and were then assayed for non-volatile extract, soluble in ether. Results showed that 95 per cent. alcohol is the most efficient menstruum for exhausting ginger in preparing the tincture.—Proc. Penna. Pharm. Assoc., 42 (1919), 180. (R. P. F.)

Tincture of Iodine.—F. Burrows and H. Droop Richmond at a meeting of the British Pharmaceutical Conference discussed tincture of iodine of two types, simple alcoholic solution and that containing potassium iodide. They recommend where potassium iodide is used, that the iodine and potassium iodide be mixed with half the water and when solution is complete add the remainder of the water, then allow the solution to warm to room temperature before slowly adding the alcohol.—*Nat. Drug.*, 49 (1919), 372. (C. M. S.)

Tincture Iodine.—*Decolorized.*—The following formulas are recommended by Robert W. Terry in lieu of the N. F. product. All contain 8.3 per cent. of combined iodine (N. F. strength).

- | | |
|--------------------------|---------------|
| 1. Ammonium iodide..... | 46.3 grammes |
| Sodium iodide..... | 50.1 grammes |
| Water, to make..... | 1000.0 mils |
| 2. Sodium iodide..... | 98.0 grammes |
| Water, to make..... | 1000.0 mils |
| 3. Potassium iodide..... | 108.5 grammes |
| Water, to make..... | 1000.0 mils |

All of the above formulas will, after standing, produce a trace of free iodine, but so slight that it could hardly be objectionable. However, if it is, it may be decolorized with a trace of sodium thiosulphate or magnesium hydroxide (milk of magnesia); if the latter is used it may be filtered out or the clear liquid decanted. The following formula will turn brown only after exceptionally longer exposure:

- | | |
|--------------------------|---------------|
| 4. Potassium iodide..... | 108.5 grammes |
| Sodium thiosulphate..... | 2.0 grammes |
| Water, to make..... | 1000.0 mils |

No alcohol appears in any of the above formulas and it is really not necessary. It may be added if desired.—*Midland Drug.*, 53 (1919), 396. (A. G. B.)

Tincture of Iodine.—*Stabilizing with Alkali Iodides.*—G. Mossler discusses this topic from the standpoint of physical chemistry and concludes that the proper proportion of iodine and potassium iodide

can be represented by the formula KI_3 . The article gives assay methods for iodine and for alkali iodide in the tincture.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2731.

Iodine Tinctures.—*Water-Soluble.*—Torald Sollmann believes it is "highly improbable" that the presence of potassium iodide in U. S. P. tincture of iodine makes it more irritant than the hydriodic acid that is present in the water-soluble tinctures. Physiological tests applied to "Burnham's Iodine," "Surgodine" and analogous non-secret preparations proved their claims of superiority over official tinctures untenable. The two proprietaries contained from 2.2 to 3.2 per cent. of free iodine and from 1.2 to 2.6 per cent. of combined iodine, chiefly hydriodic acid. The acid may be formed in the process of manufacture. Whether added or formed it probably is the solvent. In view of this Dr. Sollmann added concentrated hydriodic acid to 7 per cent. and to 3 per cent. alcoholic solutions of iodine until the mixtures could be poured into water without turbidity. One hundred mls of the 7 per cent. iodine required 1 mil of the acid (sp. gr. 1.7); 100 mls of the 3 per cent. required 0.1 mil of the acid (sp. gr. 1.7). However, the 7 per cent. iodine was not miscible in all proportions. He devised the following formulas which were miscible with water in all proportions, giving clearer solutions than Burnham's or Surgodine.

TINCTURA IODI HYDRIODICA.	7%.	3%.
Iodine.....	7 grammes	3 grammes
Hydriodic acid, sp. gr. 1.7.....	2.2 mls	1 mil
Distilled water.....	5 mls	
Alcohol, to make.....	100 mls	100 mls

Ethyl iodide, glycerin and lactic acid were unsuccessful as solvents. The results of assay are tabulated showing free iodine, acidity as hydriodic acid, total iodine, combined iodine (inclusive of hydriodic acid).—J. Am. Pharm. Assoc., 8 (1919), 534. (Z. M. C.)

Paregoric.—*Extemporaneous.*—At a meeting of the Columbus branch of the American Pharmaceutical Association, R. W. Terry suggested the following recipe, which he claims not only saves time but also insures a product of full morphine strength:

Tincture of opium	40.0 mls
Benzoic acid	4.0 grammes
Spirit of camphor	40.0 mls
Spirit of anise	40.0 mls
Glycerin	40.0 mls
Alcohol	392.0 mls
Distilled water, to make	1000.0 mls

Mix the alcohol, acid, spirits, glycerin and then add four hundred and forty-eight mls of distilled water and mix thoroughly, then add the tincture of opium. After the mixture has cooled and the contraction ceased add sufficient distilled water to make the product measure 1,000 mls. Filter if necessary.

In practice it has been found best to use 400 mls of alcohol and to reduce the quantity of spirit of anise slightly; this prevents a trace of cloudiness forming which will occur if the alcohol is not of pharmacopœial strength.—Am. Drug., 67 (1919), 260.

Tincture of Soap.—*Best Soap for.*—D. van Os reports that sesame oil directed by the Dutch pharmacopœia for making tincture of soap might well be replaced by olive oil, because a tincture made with this oil has considerably better foaming properties. Palm oil gives a very well-foaming tincture of soap also but has the disadvantage compared with the tincture made from olive oil in that on diluting with water a turbidity due to the precipitation of acid potassium palmitate is produced. Tinctures made from coconut oil and linseed oil have only poor lathering properties.—Pharm. Weekblad, 56 (1919), 679. (H. E.)

Tincture of Strophanthus.—*Preparation and Evaluation of.*—H. Helch studied methods of manufacture of this tincture from natural and defatted seed and with various alcoholic menstrua. He found diluted alcohol yielded the best tincture, the one with highest strophanthin content; that extraction with strong alcohol apparently tended to decompose strophanthin into strophanthidin; that tinctures made from seed defatted with petroleum ether had no higher strophanthin content than tinctures made from natural seed.—Pharm. Post; through Chem. Abstracts, 13 (1919), 496.

Tincture of Strophanthus.—*Variation in.*—Umney has examined a number of tinctures of strophanthus bought from different wholesalers, and reports that they differed so widely in toxicity that

it was dangerous to use them. Experience must have taught that the tincture is a very unreliable preparation since it has fallen to a great extent into disfavor and almost disuse. He, therefore, advocates that the tincture be standardized either chemically or physiologically by officially recognized reliable methods.—Brit. Col. Drug.; through Drug. Circ., 63 (1919), 185.

Tincture of Strophanthus.—*Preparation of.*—Joachimoglu prepared tinctures of strophanthus from ordinary and fat-free seeds of *Strophanthus Kombe*, *S. hispidus* and *S. gratus*, and found that the tincture prepared with ordinary Kombe seed was the most active. A tincture obtained with the fat-free Kombe seed was only about half as active as the latter, while the activity of a tincture prepared with the ordinary gratus seed was the same as that prepared with the fat-free seed. After two years a slight loss in activity was shown by the tinctures prepared with the ordinary seed while those made with fat-free seed had remained practically unaffected.—Ber. dtsch. pharm. Ges.; through Drug. Circ., 63 (1919), 444.

Tincture of Vanilla.—*Preparation.*—Bernard H. Smith criticizes the use of 95 per cent. alcohol in the preliminary maceration of vanilla beans in the N. F. IV formula, as being objectionable because it removes a resinous extractive from the beans, and which is later precipitated when the menstruum is diluted. This precipitate or cloud is almost impossible to remove by the subsequent percolation or by any ordinary method of filtration. The loss of alcohol is another objectionable feature of the N. F. IV method.—J. Ind. and Eng. Chem., 11 (1919), 953. (L. A. B.)

Tincture of Vanilla.—*Vanillin Assay of.*—Dox and Plaisance give a method of assay, based upon the employment of thiobarbituric acid in the presence of 12 per cent. hydrochloric acid. They have found this useful as a general reagent for the precipitation of aromatic aldehydes and have applied it to the quantitative determination of furfural. Under these conditions, vanillin gave with thiobarbituric acid an insoluble vermilion colored precipitate, which on analysis was shown to contain the percentage of nitrogen and sulphur required for the simple condensation product, 3-methoxy-4-hydroxybenzalmalonylthiourea. The authors tested out

this procedure as a means of quantitatively estimating vanillin.—*Am. J. Pharm.*, 91 (1919), 167. (J. K. T.)

UNGUENTA.

Ointment Bases.—E. Unna presents a general discussion of ointment bases, with particular reference to German war substitutes.—*Ber. dtsh. pharm. Ges.*; through *Chem. Abstracts*, 13 (1919), 3272.

Ointment Bases.—*Hydrogenated Oils as.*—Jones states that an ointment base made of 125 grammes of white wax and 675 grammes of hydrogenated cottonseed oil (Crisco) is as quickly absorbed as lard, is cleaner, less liable to become rancid, and is a more stable product. He suggests that hydrogenation might be conducted to such a point that the resulting product would be so hard as to avoid the necessity of adding wax.—*Am. Perf.*; through *Pract. Drug.*, Sept., 1919, 36.

Mercurial Ointment.—*U. S. P. Assay of.*—L. F. Gabel suggests the use of an extraction method for the assay of this preparation, as giving more accurate results. Gabel's method is to weigh out sample of the ointment on to defatted filter paper, transfer to Soxhlet apparatus and extract with petroleum ether from 2 to 4 hours. Dry and weigh. Analytical results are given showing comparative results with the U. S. P. method, the sulphide method and the extraction method.—*J. Ind. and Eng. Chem.*, 11 (1919), 960. (L. A. B.)

Ointment of Phenol.—*Effect of Chilling.*—J. R. Hill examined a sample of ointment of phenol B. P. and found most of the phenol had separated in a crystalline form. Investigation proved that the sample had been subjected to low temperatures during a severe spell of weather. This showed that the ointment should be protected from severe cold.—*Chem. and Drug*, 91 (1919), 1512.

Ointment Difficulties.—William Gray finds that a slight amount of heat with constant stirring is the secret of a perfect preparation in "Cream Base No. 3" or when some medicinal agent is to be added to diachylon ointment.—*J. Am. Pharm. Assoc.*, 8 (1919), 746. (Z. M. C.)

Dichloramine-T Ointment.—T. Sollmann reports that solutions of dichloramine-T in chlorcosane do not protect the large open surfaces of burns against mechanical irritation and access of air. On the contrary, the solution is absorbed by the dressing, which is then glued by the wound secretions and causes pain and injury when the dressing is changed. As a result of a study of the decomposition of dichloramine-T by different solvents, Sollmann proposes the use of an ointment of three parts of surgical paraffin and seven parts of liquid petrolatum as a protective dressing on wounds (burns) treated with dichloramine-T-chlorcosane solution. It may even be used as a basis for a dichloramine-T ointment.—J. Am. Med. Assoc., 72 (1919), 992. (W. A. P.)

Pomade Bourget.—This rheumatism ointment is said to consist of 10 parts of salicylic acid, 10 parts of wool-fat, 10 parts of oil of turpentine and 100 parts of lard.—Pharm. Weekblad, 56 (1919), 1615. (H. E.)

Protective Ointments.—*For Use against Mustard Gas.*—John M. Williams reports the results of considerable investigation of methods of protection against dichlorodiethyl sulphide. To be satisfactory an ointment should give protection for twenty-four hours but there should be no unpleasant effects from continued use; it should not be irritating, not easily rubbed off and of a consistence that gives a coating at body temperatures; the ingredients should be readily obtainable at reasonable prices and its manufacture should be neither long nor difficult. Standard methods of testing were devised and many formulas were subjected to the tests. Lanolin was found to be the best base and liquid petrolatum the poorest.

Ointments containing oxides proved better than metallic soaps, zinc oxide being the best. For field use the following formula was recommended:

Zinc oxide.....	45
Linseed oil.....	30
Lard.....	10
Neutral wool fat.....	15

It furnishes a smooth even coating, which does not rub off very easily and is not disagreeably sticky. One per cent. of burnt umber gave it a light brown tint, the natural white being objection-

able for field use. Dr. Williams explains carefully how the experiments were conducted at the Army Laboratory and gives much other valuable information.—J. Am. Pharm. Assoc., 8 (1919), 821. (Z. M. C.)

Unguentum Aluminus Albuminatum Compositum.—This is a salve containing 17 grammes of albumin, 3 grammes of alum, 0.5 gramme of mercuric sulphide, 8.5 grammes of almond oil, 1 gramme of ichthyol, 3 grammes of tincture of benzoin and 140 grammes of water. Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Unguentum Mirabile.—This consists of 0.5 gramme of mercuric oxide, 10 grammes of oil of beech (*oleum fagi æthereum*), 5 grammes of camphor, 35 grammes of paraffin ointment, 5 grammes of boric acid, 5 grammes of olive oil and 40 grammes of spermaceti.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Reclu's Ointment.—*Modified.*—Certain useless toxic or irritant ingredients have been omitted from this popular antiseptic ointment, the new formula being:

Phenol.....	1
Salicylic acid.....	1
Resorcinol.....	2
Powdered camphor.....	5
Antipyrine.....	5
Balsam of Peru.....	6
Petrolatum.....	81
Glycerin.....	enough
Water.....	enough

Dissolve the phenol, salicylic acid, resorcinol and camphor in a little glycerin. Dissolve the antipyrine in a small amount of water. Mix the balsam with the petrolatum and incorporate the two solutions.—Drug. Circ., 63 (1919), 288.

Resorcin Ointments.—*Preparation of.*—It is frequently desirable to make an ointment containing resorcin, says J. D. Monteith, and it is next to impossible to pulverize the chemical fine enough to produce a smooth preparation. Sublimed resorcin, which is in the form of impalpable powder, has been suggested, but the best method appears to be the one recommended by Brieffield, namely, to dis-

solve the resorcin in a small amount of ether and incorporate this solution with the fatty base, allowing the ether to evaporate.—Apothecary; through Pract. Drug., May, 1919, 36.

Scabies Ointment.—G. Milian suggests the following recipe: Dissolve 50 grammes of potassium sulphide in 250 grammes of water; incorporate this with 250 grammes of petrolatum and 250 grammes of wool-fat and afterwards add 5 grammes of zinc oxide and 200 grammes of liquid petrolatum.—Paris méd.; through Am. J. Pharm., 91 (1919), 316.

Tar Ointment.—*Improved Manufacture of.*—Bertha Mueller discusses the official method of preparing tar ointment and states that by reason of the heat employed, the finished product is always more or less granular. She finds it a better procedure to put the tar into a mortar warmed to 130° F. with hot water and then to add the melted wax and lard at a temperature of 130° F. and triturating until a smooth and homogenous ointment results. She criticizes the U. S. P. direction to strain the finished ointment; first because it is a mussy procedure, and secondly because the mesh of the strainer is not directed.—Am. Drug., 67 (1919), 464.

Zinc Oxide Ointment.—*Relative Value of Petrolatum and Lard as Bases.*—Edward T. Hahn and Robert P. Fischelis present statistics gathered from prescription files and opinions of physicians on the relative value of lard and petrolatum as ointment bases with particular reference to zinc oxide ointment. Out of 32,319 prescriptions examined, 1,246 or about 4 per cent. called for ointments. Of these, 791 or about 63 per cent. called for a petrolatum base and 236 or about 18 per cent. for a lard base, the balance (19 per cent.) called for wool-fat and mixed bases. Of twelve leading dermatologists in Philadelphia six give preference to petrolatum as an ointment base and the other six prefer lard.—Proc. Penna. Pharm. Assoc., 42 (1919), 165. (R. P. F.)

VINI.

Wines.—*Dealcoholized.*—An interesting outcome of prohibition is the forthcoming appearance on the market of what are now known as "dealcoholized" wines. This may save the day for the California wine industry, although the credit for the "discovery" appears to belong to the wine-producing interests of the Wine Islands of Lake Erie and adjacent mainland. Under the plan as

followed in the experiments thus far made, fermentation is carried through just as in the time-honored process of wine-making, and finally the alcohol is extracted. The result is a drink which, while it has not "the feel in the mouth" of bona fide wine, has nevertheless a distinctly pleasing quality all its own, strongly reminiscent of wine and so totally dissimilar to unfermented grape juice that there would be no competition with such products. Connoisseurs in the government service are highly pleased with the samples of dealcoholized wines that have been submitted and there will shortly be forthcoming an official ruling that will formally fix the status of the new drink under the food laws.—*Drug. Circ.*, 63 (1919), 256.

Grape Wine.—*Detection of Fruit Wines in.*—P. Medinger and Fr. Michel found that when to 15 mls of grape wine, filtered if necessary, a diluted sodium nitrite solution is added, the wine assumes a yellow or yellowish brown color and remains clear. Fruit wines under the same conditions become dark brown or brownish black, turbid and after standing a blackish precipitate settles which is insoluble in water, alcohol, ether and the usual organic solvents, but forms with caustic potash solution a Bordeaux red color. When caustic soda solution is added to the mixture of wine and nitrite solution, grape wines are colored light orange, fruit wine red. After allowing the mixture to stand for some time a red precipitate separates and the supernatant liquid in grape wine is colored yellow or light orange, that in fruit wines dark red.—*Chem. Ztg.*; through *Pharm. Weekblad*, 56 (1919), 228. (H. E.)

White Wine.—*Bactericidal Powers of.*—The French custom of drinking white wine with an oyster supper would seem to be endorsed by the report of Ch. Richet and Andre Gigon, who state that Graves kills 86 per cent and Barsac 99 per cent. of the Eberth coli-bacteria. Even lemon juice, they say, kills 92 per cent. and vinegar 40 per cent.—*Chem. and Drug.*, 91 (1919), 532. (K. S. B.)

Wine of Beef and Iron.—So long as a large mail order house in this country continues to sell *Vinum Carnis et Ferri*, N. F. in gallon jugs, the drought from prohibition legislation may not be as noticeable as it might otherwise. Seriously, however, is it not about time for the professions of medicine and pharmacy to heave into the discard such utterly unscientific combinations as "Beef, Wine and Iron?"—*J. Am. Med. Assoc.*, 72 (1919), 498. (W. A. P.)

D—NEW REMEDIES AND TRADE-NAMED

PREPARATIONS

NOTE.—The paragraphs in this chapter having journal references in parentheses are taken from the Report of the Committee on New Remedies published in the Proceedings of the New York State Pharmaceutical Association, 1919, pages 202 to 216.

Incompatibilities of Some Newer Remedies.—Ivor Griffith gives a compilation of information on the nature and, in some cases, incompatibilities of apothesine, arsphenamine, arsphenamine-S, barbital, barbital-S, benzyl benzoate, benzyl alcohol, bismuthemetine-iodide, chloramine-B, chloramine-T, chlorcosane, Dakin's solution, dichloramine-T, halazone and procaine.—Proc. Penna. Pharm. Assoc., 42 (1919), 268. (R. P. F.)

Acetyl-Amido-Ethoxy Benzene.—To the foregoing chemical name the coined name *Pertonal* has been given, which no doubt will make it popular with the laity and tend to encourage self-medication in the same manner that the giving of the euphonious title "*aspirin*" to acetylsalicylic acid has proven. The action of this combination has been studied and compared to acetphenetidine. Its toxicity is one-half the latter. As an antipyretic it takes twice the dose of acetphenetidine and instead of being depressant like it, pertonal is stimulating to the heart. The action of the drug is less abrupt and more prolonged than that of acetphenetidine. The dose is from 0.6 to 1.2 grammes.—Am. J. Pharm., 91 (1919), 365. (J. K. T.)

Adhesitin is a light brown solution, having the odor of alcohol and benzoin, used to prevent the falling of eye-glasses.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Agarulin, made by B. Siegfried in Zofingen, is agar-agar with buckthorn extract.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Agomensin is a glandular product derived from the corpus luteum and marketed in tablet form by the Society of Chemical Industry, Basel, Switzerland. (Am. Dr.)

Albromin is a solution of the valeric acid ester of benzoyl methyl alcohol to which a small amount of adrenaline is added. According to an investigation of Dr. Kirchner the product is a mixture of cocaine and phenylurethane to which sodium chloride and phenol are added.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Albutannin is a compound of tannin and albumin, thoroughly exsiccated and containing about 50 per cent. of tannic acid in combination. It was first introduced as *tannalbin*. The use of albutannin is based on the assumption that the tannin compound passes the stomach largely unchanged and thus the astringent action will be exercised in the intestine where the compound will be decomposed by the intestinal fluid, slowly liberating the tannic acid. Albutannin is used in diarrhea, particularly in that of children, and in phthisis.—J. Am. Med. Assoc., 73 (1919), 1363. (W. A. P.)

Allergens is a class-name applied by Squibb and Sons, to the concentrated proteins of foods. These protein products are used in cases in which persons show a peculiar hypersensitiveness or idiosyncrasy to certain articles of the dietary, both to determine to which food it is due and to immunize the patient against the effects of the food. The test for sensitiveness is made by scarifying the skin and rubbing in the protein to be tested, either dry or in solution. When the production of an urticarial wheal identifies the protein to which a patient is sensitive, the patient is desensitized by administration of gradually increasing amounts of the offending food of the isolated food protein itself.—J. Am. Med. Assoc., 72 (1919), 573. (W. A. P.)

Allocaine S., a new local anesthetic, is described as a white odorless powder, consisting of fine needles, with a bitter and astringent taste, producing on the tongue a tingling sensation, followed by temporary numbness. It dissolves easily in alcohol, and in water with a neutral or slightly acid reaction. It has the formula $C_6H_5CH(OCOC_6H_5)CH(CH_3)HNC_2H_5.HCl$. On account of the slight irritation by its acid solution and of its precipitation by tissue fluids, its use is limited.—J. Pharmacol.; through Pharm. Era, 52 (1919), 313.

Allylen, for tubercular troubles, is prepared from garlic.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Ambrine Candles form an ingenious and convenient method of applying ambrine to burns. The candle is lighted and the melted ambrine allowed to drop on the affected parts. The Anglo-French Drug Company, Ltd., of London, have placed them on the market. (Am. Dr.)

Amnesin contains in each mil 0.012 gramme each of morphine lactate and narcotine lactate and 0.2 gramme of quinine and urea hydrochloride.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Anthelmin Capsules, marketed by Hausmann & Co. in St. Gallen, Switzerland, contain oil of chenopodium.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Anthemor Suppositories, marketed by Hoffman La Roche & Co., contain airol, hydrastinine and thigenol.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Antilax, of the Doetsch Grether Co. in Basle, is very finely divided bolus.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Antimeristem Schmidt is a preparation claimed to be useful in the treatment of inoperable cancer and as a supplementary treatment after operation for cancer. The treatment has been found without effect and no license for the sale of Antimeristem Schmidt has been granted by the U. S. Treasury Department and therefore its importation into this country is prohibited.—J. Am. Med. Assoc., 73 (1919), 1787. (W. A. P.)

Argatoxyl is the silver salt of para-amino-phenyl arsenic acid containing 33 per cent. of silver and 23 per cent. of arsenic. It is used for subcutaneous injections with olive oil in cases of blood poisoning.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Arsenoven S. S. is claimed to contain dimethylarsenin 15.4 grains, mercury biniodide 1/10 grain, sodium iodide 1/2 grain. Dimethyl-arsenin is asserted to be similar to sodium cacodylate, but with a more pronounced therapeutic action. It has been denied admission into New and Nonofficial Remedies.—J. Am. Med. Assoc., 73 (1919), 353. (W. A. P.)

Ascoleine, marketed by F. Moussant and H. Rivier in Paris, is recommended as a substitute for cod liver oil. According to the investigation of Dr. Isaovesco cod liver oil contains a lipoid which belongs to the group of the lecithides but differs from these in constitution and therapeutic action. This lecithide is obtained by treating cod liver oil successively with acetone and alcohol and subsequently purifying the product by ether; it occurs as an orange-yellow, honey-like substance which is soluble in acetone, soluble in ether, alcohol, benzene and chloroform. It melts at 70° and is present in the cod liver oil to an amount of 0.02 per cent. Ascoleine is a solution of this lecithide in olive oil and is applied both internally and hypodermically.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Astrophyrin is a name for acetylsalicylic acid manufactured in Sweden by the Astra Co.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Atreol is an aqueous solution containing as its principal constituent the ammonium salts of a mixture of organic acids containing nitrogen in the sulphonic radical which results from the action of sulphuric acid on certain petroleum distillates. Atreol is applied locally for promoting the absorption of swellings and effusions in contusions following fractures, etc. It is claimed to be useful in dermatologic and gynecologic practice. It may be used in aqueous solutions, ointments and suppositories.—J. Am. Med. Assoc., 72 (1919), 1463. (W. A. P.)

Bachmann's Kalkpulver consists of equal parts of calcium carbonate and calcium lactate.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Basalon is the name given to a new ointment base said to be of vegetable origin and capable of holding a large percentage of water (Am. Dr.)

B. Iodine and B. Oleum Iodine.—The Council on Pharmacy and Chemistry reports that while B. Iodine is said to be "Nitrogen Hydrate of Iodine" and B. Oleum Iodine a 5 per cent. solution thereof, the examination made in the A. M. A. Chemical Laboratory indicates that the first is a simple mixture of iodine and ammonium iodide, and the second a solution of iodine in liquid petrolatum. The Council declared these preparations inadmissible

to New and Nonofficial Remedies. --J. Am. Med. Assoc., 72 (1919), 365. (W. A. P.)

Borsal for the treatment of wounds is a mixture of equal parts of boric acid and salicylic acid.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Bull's Herbs and Iron Compound is a weak alcoholic solution containing iron, phosphates, sugar and vegetable derivatives, among which are quinine, red pepper, gentian and podophyllum. It was declared misbranded under the Federal Food and Drugs Act.—J. Am. Med. Assoc., 72 (1919), 1316. (W. A. P.)

Cachets Pronto for rheumatism, gout, etc., manufactured by Hausman & Co., in St. Gallen, Switzerland, contain quinine, amidopyrin, salipyrin and guarana.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Cæmmerer's Terpenraudesalbe is used in mange of horses.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Calomelettes are oblong cakes of cacao butter containing 50 per cent. of calomel in a state of very fine subdivision and thorough distribution through the mass. The blocks are perfumed and colored pink. They are recommended to replace blue ointment in the inunctive treatment of lues. Parke, Davis & Co., are the manufacturers. (Am. Dr.)

Calorosan Tablets of Dr. O. Vogt in St. Gallen, Switzerland, contain each 0.25 gramme of calcium lactate.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Camiophen is an ointment prepared from equal parts of iocamphen and of a mixture consisting of cacao butter, lard, wax and oil. Iocamphen is prepared from 10 parts of iodine, 20 parts of phenol and 70 parts of camphor.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Capsogen, marketed by Southall Bros. & Barclay, Ltd., Birmingham, England, is a surgical dressing prepared from cotton and gauze which are impregnated with tincture of capsicum and

methyl salicylate. It is recommended as wet or dry bandage in the treatment of rheumatism, gout, etc.—Pharm. Weekblad, 56 (1919), 1610. (H. E.)

Carsalon Suppositories of Bruno Solomon, Charlottenburg, Germany, contain naphthalin and an extract prepared from garlic; it is used for worms.—Pharm. Weekblad, 56 (1919), 1610. (H. E.)

Case's Rheumatic Specific.—More than five years ago, the *Journal of the American Medical Association* exposed Case's Rheumatic Specific, the A. M. A. Chemical Laboratory showing that its essential drug was sodium salicylate. Now comes the United States Post Office and interferes with Mr. Case's presumably lucrative quackery by denying him the use of the mails.—J. Am. Med. Assoc., 73 (1919), 852. (W. A. P.)

Cerol, marketed by Merck & Co., is a synthetic compound related to arecoline and is used as a substitute for this alkaloid. It is dispensed in ampuls each containing 7.5 mls of a 50 per cent. aqueous solution.—Pharm. Weekblad, 56 (1919), 153. (H. E.)

Cesol is the chlormethylate of pyridine beta-carbonic acid methyl ester; it occurs as a white crystalline powder which forms with water and alcohol neutral solutions; it melts between 102 and 104°. It is recommended for quenching the thirst in diabetes, and for botulism as a diaphoretic, in doses of 0.1 to 0.2 gramme.—Pharm. Weekblad, 56 (1919), 1610. (H. E.)

Chase's Rheumatic Specific.—The A. M. A. Chemical Laboratory found this to have essentially the following composition: sodium salicylate 22.4 per cent., magnesium oxide 5.3 per cent., licorice root 72.3 per cent.—J. Am. Med. Assoc., 72 (1919), 1560. (W. A. P.)

Chionacea is declared by the manufacturers to contain in each fluidounce, "Tinct. chionanthus 180 min., Tinct. echinacea 90 min., Euonymus 12 grs., Lappa 16 grs., Taraxacum 16 grs., Syrup senna 120 min., Sol. sodium phosphate conc. 24 min." The Council on Pharmacy and Chemistry criticize this preparation as an unscientific combination of drugs.—J. Am. Med. Assoc., 72 (1919), 1787. (W. A. P.)

Chlorogen Alther is a compound solution of aluminum chloride which evolves the gases oxygen and chlorine and is used as a substitute for Prophylacticum Malebreine. (Chem. Abstracts.)

Chloro-mercuric Fluorescein.—*A New Urinary Antiseptic.*—Davis, White and Rosen of Johns Hopkins Hospital discuss this body which is formed by the introduction of one atom of mercury into the fluorescein molecule. After intravenous injection, it is excreted by the kidney as rapidly as phenolsulfonephthalein. In a dilution of 1 in 10,000 it will inhibit the development of the colon bacillus, or *Staphylococcus aureus*. The single lethal dose for rabbit or dog is about 20 milligrammes per body weight and the computed lethal dose for man is 140 times the dose producing antiseptis.—J. Urol.; through Chem. Abstracts, 13 (1919), 137.

Chloro-Stahl, prepared by Dr. W. Stahl in Freiburg, contains chlorophyll, lecithin, calcium glycerophosphate and nutritive salts.—Pharm. Weekblad, 56 (1919), 154. (H. E.)

Cinchophen is the trade name for acid phenylcinchoninic, of the U. S. P. IX, formerly known as atophan. It is marketed under this name by the Calco Chemical Company of New York City.

Cocochine is a wine containing cinchona, cola, coca, and glycerophosphates.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2729.

Coffeospirin and Coffeospirin Compositum are new names for citrospirin and citrospirin compositum. The first contains acetylsalicylic acid and citrated caffeine, while the second also contains morphine hydrochloride.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Collo-Iode is a product claimed by its Parisian manufacturer to be "a colloidal vegetable-iodine combination," which results "from the molecular fixation of iodine on a vegetable colloid extracted from gluten." The chemists of the Laboratory of the American Medical Association find one of the two preparations, *collo-iodine drops*, to be an aqueous solution of an iodide or a compound which responds to the usual tests for iodides, with an iodine content of 4.27 per cent. The other preparation, *collo-iodine injectable*, was a

light brown oily liquid, smelling like cineol, having a density of 1.1855 at 15.6°; containing 26.55 per cent. of iodine (none free) and leaving after steam distillation 82 per cent. of fatty oil residue. The product passing over with the steam was found to be cineol.—Rep. Lab. Am. Med. Assoc.; through Chem. Abstracts, 13 (1919), 2254.

Collosol Preparations.—The Council on Pharmacy and Chemistry reports that Collosol Argentum, Collosol Arsenicum, Collosol Cocaine, Collosol Cuprum, Collosol Ferrum, Collosol Hydrargyrum, Collosol Iodine, Collosol Manganese, Collosol Quinine and Collosol Sulphur are inadmissible to New and Nonofficial Remedies because their composition is uncertain. In the few cases in which the therapeutic claims for these preparations were examined, the claims were found so improbable and exaggerated as to have necessitated the rejection of these products on this account.—J. Am. Med. Assoc., 72 (1919), 1694. (W. A. P.)

Collosol Manganese.—Stephen's, Yorke, Blacklock, Macfie, Cooper, and Carter report in the "Annals of Tropical Medicine and Parasitology" the results of their investigation for the English government of Collosol Manganese conclude that Collosol Manganese in the doses used is of no value in the treatment of simple tertian malaria.—J. Am. Med. Assoc., 72 (1919), 1318. (W. A. P.)

Corypinol is a snuff consisting of coryfin and oil of *Pinus pumilionis*. (Chem. Abstracts.)

Creosotonic is claimed by the manufacturers to be iodinated emulsion containing alcohol, creosote and guaiacol sulphonates, and compound hypophosphites (including quinine and strychnine). It was rejected by the Council on Pharmacy and Chemistry of the American Medical Association because of unwarranted claims made for it. (J. A. M. A.)

Culture-Lac is a culture of *Bacillus bulgaricus* in whey, marketed in bottles containing about 4 fluidounces. It is adapted both for internal and external use. J. Am. Med. Assoc., 73 (1919), 767. (W. A. P.)

Cuprase is stated to be a colloidal copper hydroxide containing 0.00121 gramme copper per 6 mil ampul. A box of eight ampuls

is sold by the agents for eight dollars and fifty cents, less 10 per cent. discount. The Council on Pharmacy and Chemistry reports that the therapeutic claims made in the advertising are those commonly made for cancer "cures" and are about equally convincing. It declares that some of the claims cannot be too severely condemned in a preparation which at best has only an experimental status. The evidence for the value of Cuprase published by the manufacturers or agents presents only vague generalities and no definite data. On the other hand, the evidence gathered by Weil some years ago permits an estimate of the value of Cuprase, and it is entirely unfavorable.—J. Am. Med. Assoc., 72 (1919), 1095. (W. A. P.)

Cylarsol is a complex salt obtained by the action of methyl arsenic acid on mercury salicylate. It is marketed by Dr. Baljet, de Moor & Co. in Arnhem, Holland, in the form of ampuls, each containing 2 mls of a 3 per cent. solution.—Pharm. Weekblad, 56 (1919), 154. (H. E.)

Cystinal Tablets, made by Merck, contain in each tablet 0.5 gramme of cysteën-mercuric-sodium chloride.—Pharm. Weekblad, 56 (1919), 154. (H. E.)

Depilagiene, is, according to the chemists of the American Medical Association Laboratory, essentially a mixture of barium sulphate, barium sulphide, sulphur and starch. The amount of barium sulphide was found to be 22.6 per cent.; this is equivalent to about 45 per cent. of commercial barium sulphide. Depalagiene has no claim to originality, as practically all chemical hair removers are composed of some form of sulphide. Naturally, the preparation is likely to cause more or less irritation of the skin.—J. Am. Med. Assoc., 72 (1919), 746. (W. A. P.)

DeSanctis Gout Pills have been found by the chemists of the American Medical Association to contain powdered colchicum seed, benzoic acid and milk sugar. There was also present fatty material which resembled the fat of colchicum seed, but might be in part added fatty acid. It was concluded that De Sanctis' pills are essentially five grain doses of colchicum seed.—J. Am. Med. Assoc., 73 (1919), 213. (W. A. P.)

Dextri-Maltose No. 3, Mead's.—A mixture containing approximately maltose, 23.1 per cent. dextrin, 42.6 per cent., and moisture, 4.3 per cent. On the claim that maltose is more readily assimilable than other forms of sugar, Mead's dextri-maltose No. 2 is proposed for use in the diet of adult invalids. (J. A. M. A.)

Diadermin is a cream for the skin and is prepared by melting 85 parts of stearic acid with 40 parts of water and 25 parts of ammonia water until an ammonia soap is formed and the excess of ammonia is expelled; then 350 parts of glycerin are added.—Pharm. Weekblad, 56 (1919), 1611. (H. E.)

Diabetol.—In 1910 Professor Millspaugh at the Field Museum, Chicago, found this herb to be from a shrub.—*Stenolobium stans*—growing in Arizona, Mexico and Central America.—J. Am. Med. Assoc., 72 (1919), 1560. (W. A. P.)

Digitan is the new name given to the digitalis derivative formerly prepared in Germany and named digipuratum and which is now prepared in America under a Federal Trade Commission license granted to Merck & Co. It is stated to be identical with digipuratum and physiologically tested and standardized in the original way. (Am. Dr.)

D. O. D. Specific No. 3 is recommended for a number of diseases including diphtheria, barber's itch and colic. The chemists of the Laboratory of the American Medical Association found that it is composed of 3 per cent. of potassium permanganate and 97 per cent. of sodium bicarbonate.—Rept. Lab. Am. Med. Assoc.; through Chem. Abstracts, 13 (1919), 2253.

Eczematin is a salve evolving oxygen and containing calcium.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Effervescente Granulare consisted of over 13 per cent. sodium bicarbonate, 61 per cent. of sugar, 3 per cent. of borax, and 17 per cent. potassium bitartrate. Though invoiced as "Eff. Magnesia" it contained no magnesia. It was declared misbranded. J. Am. Med. Assoc., 72 (1919), 1316. (W. A. P.)

Elbon.—This is the name given to a combination of cinnamic acid with oxyphenylurea. It is used as an antipyretic particularly

in the treatment of tuberculosis. The dose is from 30 to 60 grains in twenty-four hours, continued for fifteen to twenty days. It is said to have exhibited markedly efficacious results in the treatment of tuberculosis. (Am. Dr.)

Elixir Novo-hexamine consists, according to the chemists of the American Medical Association of hexamethylenamine, 12; monosodium phosphate, 11; glycerin, 23; alcohol, 2; water and caramel enough to make 100. (C. A.)

Eukodal or *dihydroxy-codeinene*, is a narcotic derived from thebaine and acting like morphine. It is used as an analgesic, being less toxic than morphine. It should not be used continuously except under the express instructions of the physician.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 3272.

Eustin is exploited as a stimulant, used to overcome hunger and fatigue. It is alleged to contain as active ingredient in each tablet, 0.2 gramme of "aromatized Malvaceæ." According to J. Herzog, each tablet (1.04 gramme) contains 0.54 gramme of calcium carbonate. Answering the foregoing, the manufacturers explain that on account of war necessity, they were compelled to substitute calcium carbonate for lactose and starch formerly used as a vehicle.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2967.

Eutosal.—A *Synonym for Acetylsalicylic Acid.*—Eutosal has been adopted by the Australian Pharmaceutical Society to designate acetylsalicylic acid.—Chem. and Drug., 91 (1919), 627. (K. S. B.)

Fabriseife, formerly *ullaseife*, is a soft gray mass consisting of potash soap, 30; quince seed, 0.5; aluminum, 1.5; acetic acid, 40; sulphur, 15; calamine, 5; white bole, 2; pulv. herbar, 8.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Fagol is a creosote derivative obtained as a condensation product of creosote with formalin. It occurs as a white crystalline powder.—(Am. Dr.)

Feolathan is iron and ammonium lactate, a dark brown powder, slightly soluble in water and used as a reconstructive tonic. It is

marketed in pill form by Goedicke & Co., of Leipzig, each pill containing 0.1 gramme ($1\frac{1}{2}$ grains) of the compound.—(Am. Dr.)

Formosol is claimed to contain 18 per cent. of formaldehyde in a solution of soap.—(J. A. M. A.)

Gelargin is a silver-gelatin preparation, made by a similar process as albargin. It is manufactured by the Astra Co., in Sweden.—Pharm. Weekblad, 56 (1919), 154. (H. E.)

Glukofos for rachitis and scrofulosis, is a zymophosphate of calcium. It is obtained in the sugar fermentation and is claimed to have the formula $C_6H_{10}O_4PO_4Ca$. Manufactured by the Astra Co., in Sweden.—Pharm. Weekblad, 56 (1914), 154. (H. E.)

Glykotam is an emulsion containing benzoic acid and borates. It is used as a substitute for glycerin cream.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Hale's Epileptic Relief upon examination by the chemists of, the American Medical Association was found to be a brown liquid of aromatic odor and of saline taste. Analysis indicated 20.73 grammes of potassium bromide in 100 mils (or 13 grains per dose). The pills to be used with it contained an emodin-bearing drug, probably aloes.—Rept. Lab. Am. Med. Assoc.; through Chem. Abstracts, 13 (1919), 2729.

Haven's Wonderful Discovery according to its manufacture contains oil of wintergreen, oil of sassafras, oil of black pepper, spirit of camphor, spirit of turpentine, spirit of chloroform, tincture of arnica and alcohol and was called Haven's Rheumatic Remedy before its supposed effect on "flu" was discovered. The Council on Pharmacy and chemistry finds it an unscientific, irrational mixture, marketed under therapeutic claims which are unwarranted and without foundation.—J. Am. Med. Assoc., 72 (1919), 883. (W. A. P.)

Hedroine is a new name for heroin.—Pharm. Weekblad, 56 (1919), 154. (H. E.)

Hexapyrin of Dr. L. Egger in Budapest is hexamethylene-tetramine acetylsalicylate.—Pharm. Weekblad, 54 (1919), 155. (H. E.)

Hirathiol is an aqueous solution of a synthetic product, the important medicinal constituents of which are ammonium compounds containing sulphur in the form of sulphonates, sulphones and sulphides. It is claimed that hirathiol is equivalent in every respect to the original ichthyol; hence, its actions, uses and dosage should be similar to that of the older preparation. Hirathiol is a syrupy, brownish black liquid, having a characteristic empyreumatic odor. It is soluble in water, glycerin and alcohol. It is miscible with fats.—J. Am. Med. Assoc., 72 (1919), 1215. (W. A. P.)

Hormotone is advertised as a "pluriglandular tonic for asthenic conditions." Each tablet is said to contain 1/10 grain of desiccated thyroid and 1/20 grain of active pituitary together with the hormones of the ovary and testes. It has been denied admission to New and Nonofficial Remedies.—J. Am. Med. Assoc., 73 (1919), 549. (W. A. P.)

Hyporit, according to P. Michaelis, is an almost pure calcium hypochlorite containing a little calcium chloride and a very little lime. It has 80 per cent. available chlorine and forms a stable powder which can be compressed into tablets of accurate dosage. It readily dissolves in water to an almost clear, very faintly alkaline solution that may be used as a substitute for Dakin's solution.—Münch. med. Wochschr.; through Chem. Abstracts, 13 (1919), 2958.

Ibol, made by Merck & Co., is a surgical powder containing iodine. The iodine is not chemically combined but adsorbed by charcoal. It contains 5 per cent of iodine, bolus and talcum in addition to charcoal. The iodine is not extracted by water and the odor and irritating action of the iodine are considerably decreased in this preparation.—Pharm. Weekblad, 54 (1919), 155. (H. E.)

Incarbon is a suspension of highly active sterile blood charcoal for intravenous use. It forms stable compounds with toxic doses of diphtheria and tetanus toxins when the latter are injected into the blood stream.—(C. A.)

Iodinized Emulsion is claimed by the manufacturers to contain in each fluidrachm, $4\frac{3}{4}$ minims of alcohol, $3\frac{1}{2}$ minims of rectified oil of turpentine, $\frac{1}{8}$ grain of iodine, $\frac{1}{2}$ grain of phenol, glycerin, elixir of lactated pepsin and aromatic oils. It was rejected by the Council on Pharmacy and Chemistry of the American Medical Association because of unwarranted claims made for it. (J. A. M. A.)

Kalzan is a double lactate of lime and soda marketed in tablet form, each tablet containing half a gramme (8 grains) of the compound. It is indicated wherever calcium is to be administered internally.—Pract. Drug., Apr., 1919, 36.

Kardysat is a synonym for digitalyst. Burger.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Katharmon, according to the manufacturers "represents in combination Hydrastis canadensis, Thymus vulgaris, Mentha arvensis, Phytolacca decandra, $10\frac{1}{2}$ grains Acid Borosalicylic, 24 grains Sodium Pyroborate to each fluidounce of Pure Distilled Extract of Witch Hazel." The chemists of the American Medical Association Laboratory find the mixture is alkaline in reaction, hence the presence of free acids is impossible. They found sodium borate and sodium salicylate and merely a trace of alkaloid.—Chem. Abstracts, 13 (1919), 1900.

Kline's Nerve Remedy.—This epilepsy nostrum was analyzed by the A. M. A. Chemical Laboratory and found to be a bromide preparation and practically identical with Waterman's Tonic Restorative.—J. Am. Med. Assoc., 72 (1919), 1560. (W. A. P.)

Kuhn's Rheumatic Mixture was found to contain potassium iodide, iodine and sugar, with indications of small amounts of plant material and aromatics. It has been declared misbranded under the Federal Food and Drugs Act.—J. Am. Med. Assoc., 73 (1919), 1157. (W. A. P.)

Kwik-Olinal is an oily suspension of mercuric salicylate in sterilized olive oil and anhydrous wool-fat. It is used as an injection in the treatment of lues.—Pract. Drug., Aug., 1919, 38.

Lane's Asthma Cure.—The A. M. A. Chemical Laboratory reports that Lane's Treatment, double strength, for Hayfever and Asthma (formerly called Lane's Asthma Cure) was found to be essentially a solution of calium iodide, alcohol and water, with vegetable extractives and sugar.—J. Am. Med. Assoc., 72 (1919), 1386. (W. A. P.)

Lavoris, according to its manufacturers, contains zinc chloride, resorcin, menthol, saccharin, formalin, oil of Ceylon cinnamon and oil of cloves. Recent analysis in the A. M. A. Chemical Laboratory demonstrated that the Lavoris now sold contains no resorcin and that the zinc content is equivalent to 0.1 gramme per 100 mils or about $\frac{1}{2}$ grain to the ounce.—J. Am. Med. Assoc., 73 (1919), 1380. (W. A. P.)

Lecithin Iron Tincture is a solution of iron pyrophosphate and ammonium citrate with 0.4 per cent. of egg lecithin.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Leojodin are tablets containing 0.05 gramme of iodine in combination with protein.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Leukosin, made by the Astra Co. in Sweden, is pure sodium nucleinate obtained from beer yeast.—Pharm. Weekblad, 54 (1919), 155.

Lower's Hot Springs Pure Blood Remedy was found to be a weak alcoholic solution containing sugars, small amounts of chlorides, iodides and sulphates (probably as the sodium salt) and vegetable extractives, among which are podophyllum and an atropine-bearing drug. It has been declared misbranded under the Federal Food and Drugs Act.—J. Am. Med. Assoc., 73 (1919), 1151. (W. A. P.)

Luvein Arsans is claimed by the manufacturer to be "di hypo sodio calcio phosphite hydroxy arseno mercuric iodide," while luvein arsans Nos. 1, 2 and 3 are "meta hydroxy iodide sodio arsano mercuric dimethyl benzo sodio arsenate ai oxy sodio tartaria sulpho diphenyl hydrazine." This nomenclature according to the chemists of the American Medical Association is an insult to the intelligence

of the medical profession.—J. Am. Med. Assoc., 73 (1919), 927. (W. A. P.)

Lysine.—*Disinfecting Power of.*—G. Sampietro finds that the disinfectant sold under this name consists of a 2.88 per cent. solution of formaldehyde "containing inorganic salts and essences." In 5 per cent. solution it shows no bactericidal action within an hour while spores are killed by a 20 per cent. solution only after the lapse of seven days.—Arch. Farm. Sper.; through J. Soc. Chem. Ind., 38 (1919), 842A.

Marmite is a food extract made from yeast. Its manufacturers claim for it the following composition: Water, 26.84; extractive, 34.67; proteids, 10.50; mineral matter, 26.95 per cent. Such preparations resemble beef extracts so closely in their general characters that they have been used in the adulteration of genuine meat extracts. It is as yet by no means certain whether these yeast extracts have the same physiological effect as extracts of beef, while the larger proportion of nuclein in yeast causes them to be very rich in purin bodies, which are certainly harmful to some persons; used in moderation, however, as flavoring agents, they may prove to be of use in the kitchen.—Pharm. J., 102 (1919), 54.

Mederine is a hydro-alcoholic solution of sugar, potassium iodide, methyl salicylate, salicylic acid, glycerin and laxative plant extracts. It has been declared misbranded under the Federal Food and Drug Acts.—J. Am. Med. Assoc., 73 (1919), 1458. (W. A. P.)

Medinal is a proprietary name applied to barbital sodium (sodium diethylbarbiturate) the sodium salt of barbital or diethylbarbituric acid which was first introduced as veronal. The Council on Pharmacy and Chemistry reports that Medinal was omitted from New and Nonofficial Remedies in 1916, because the advertising contained misleading and unwarranted therapeutic claims.—J. Am. Med. Assoc., 73 (1919), 1542. (W. A. P.)

Mercurochrome-220.—H. H. Young, E. C. White and E. O. Swartz publish a preliminary report of experimental and clinical work which was carried out in an effort to produce an effective urinary antiseptic. Being impressed with the results obtained with

acriflavine, the authors attempted to modify various dyes in such a way that they should possess the penetrating properties of dyes and at the same time be germicidal and relatively non-toxic and non-irritating. Of the compounds produced, the product which has been named "Mercurochrome-220" is the most promising. Chemically, Mercurochrome-220 is dibromoxymercuryfluorescein or its sodium salt and is obtained by substituting one atom of mercury in a molecule of dibromfluorescein. The free acid is a red powder, insoluble in water but readily soluble in sodium hydroxide solution with formation of a deep cherry red color showing fluorescence on dilution. The sodium salt forms iridescent green scales which are slightly hygroscopic and readily soluble in water. The solution stains the skin red, but the stain is easily removed by first rubbing on a 2 per cent. potassium permanganate solution and then treating with a 2 per cent. oxalic acid solution. The salt contains the mercury in masked form and therefore does not respond to ordinary mercury reagents.—J. Am. Med. Assoc., 73 (1919), 1483. (W. A. P.)

Methyl-phenol Serum is a serum impregnated with methylene blue and phenol. It is used as an intravenous injection in gonorrhea.—Pract. Drug., Aug., 1919, 38.

Micajah's Wafers and Suppositories.—These preparations have been refused admission into New and Nonofficial Remedies. The "wafers" were analyzed in the A. M. A. Chemical Laboratory, in 1910, and found to consist essentially of dried (burnt) alum, boric acid and borax. The suppositories were recently examined in the A. M. A. Chemical Laboratory and, like the "wafers," were found to contain alum, boric acid, and borax—and these substances practically alone—incorporated in cocoa butter. The company claims that "to these have been added Ammonii Ichthyosulphonate, Balsam of Peru, Ext. Belladonnæ." The A. M. A. chemists report, however, that if extract of belladonna is present at all, it is in amounts too small to be detected by the methods commonly employed in the chemical examination of alkaloidal drugs. The chemists report further that while ammonium ichthyosulphonate and balsam of Peru both have a decided odor and a dark color, the suppositories have but little color, and the odor of cocoa butter which forms their base is not covered by these drugs. Obviously, therefore, if ammonium ichthyosulphonate and balsam of Peru are

present at all, the amounts are utterly insufficient to exert any therapeutic effect.—J. Am. Med. Assoc., 73 (1919), 1715. (W. A. P.)

Miles' Heart Treatment.—According to the chemists of the laboratory of the American Medical Association this preparation is essentially a solution of a compound or compounds of iron representing about 0.12 gramme metallic iron in 100 mils. Physiologic tests failed to show presence of digitalis bodies. A solution of iron glycerophosphate in 10 per cent. alcohol, with about 5 per cent. glycerin, and a little sugar or glucose had much the same chemical properties as Miles' Heart Treatment.—J. Am. Med. Assoc., 73 (1919), 287 (W. A. P.)

Natol is an aromatized, crude, heavy mineral oil colored red and sold for use in veterinary practice as a mechanical evacuant superior to linseed oil. Parke, Davis & Co., are the manufacturers.—(Am. Dr.)

Sodium Morrhuate consists of the sodium salts of the fatty acids of cod liver oil. It is used hypodermically in a 3 per cent. solution in the treatment of tuberculosis.—Pharm. Weekblad, 56 (1919), 155. (H. E.)

Nature's Remedy Tablets.—A. H. Clark of the A. M. A. Chemical Laboratory reports that "Nature's Remedy" is claimed to contain ten ingredients; that the manufacturers declare seven of these—burdock, juniper, sarsaparilla, mandrake, rhubarb, dandelion and prickly ash; and that the manufacturers state they are "more proud" of the other three, but refrain from naming them for fear from imitators. Clark's analysis, supplemented by a microscopic examination by E. N. Gathercoal at the University of Illinois School of Pharmacy, indicated that the unnamed drugs are aloes (or a preparation of aloes), cascara bark and belladonna root. The microscopist stated that rhubarb, as well as all the other named drugs, if present at all are there in such small quantities that no evidence of their presence was seen. As a result of the examination and a consideration of their powerful cathartic action, it is believed that Nature's Remedy is, essentially, aloes or aloin, cascara, and belladonna with, probably, resin of podophyllin (instead of man-

drake) a common cathartic mixture.—J. Am. Med. Assoc., 72 (1919), 815. (W. A. P.)

Novarsenobillon, according to Dr. Carlill, has proved a safe and efficient remedy against the ravages of *Spirochæta pallida*.—(Ch. Dr.)

Nu Tone, according to its manufacturers, contains 25 per cent. of cod liver oil, $9\frac{1}{3}$ per cent. of extract of malt, beef juice, glycerin, calcium and sodium hypophosphites and fluidextract of nux vomica. —(J. A. M. A.)

Nuxated Iron.—The analysis in the A. M. A. Chemical Laboratory indicated that Nuxated Iron Tablets contained only $1/25$ grain of iron, while the amount of nux vomica was practically negligible.—J. Am. Med. Assoc., 72 (1919), 1560. (W. A. P.)

Oxyral is a name for capsules which contain an emulsion prepared with oil of chenopodium, they are used four times a day for expelling intestinal worms. Manufactured by R. & O. Weil at Frankfurt.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Pallamine is a colloidal preparation of palladium recommended by J. E. R. McDonagh in the chemo-therapeutic treatment of gonorrhea.—Pharm. Era, 52 (1919), 72.

Panglandine prepared by C. H. Couturieux is a name for tablets which contain physiologically active substances in form of an extract prepared in a vacuum. The preparation contains thyroid glands, thymus glands, pituitary glands, hypophysis, pancreas, liver, kidneys, ovaries, lungs, etc.—Pharm. Weekblad, 56 (1919), 1609. (H. E.)

Paraphenetolcarbamide occurs as light-red crystals. It is used as a sweetening agent, being 250 times sweeter than sugar.—Pharm. Weekblad, 56, (1919), 156. (H. E.)

Parrafitoria is the trade name for a suppository base used in place of cacao butter where the latter is not available. It is said to melt at body temperature.—Pract. Drug., Aug., 1919, 38.

Partola.—A physician reports that a patient taking Partola as a blood purifier is now in a rundown condition with discoloration of the skin and a craving for the drug and that another patient took three tablets before going to bed, developed cramps and aborted the next day in her third month of pregnancy. Analysis indicated Partola to be tablets containing 2.64 grains phenolphthalein per tablet, sugar, starch and oil of peppermint.—J. Am. Med. Assoc., 73 (1919), 55. (W. A. P.)

Paw Paw Tonic.—An advertisement declares that "Paw Paw Tonic" contains no alcohol, but admits that it contains port wine. A newspaper item details the conviction of a Charlotte, N. C., druggist for selling this tonic to young men who became drunk from drinking it. The counsel for the druggist maintained that if Paw Paw Tonic was taken according to directions, the medicine would not produce intoxication. The jury decided that a "patent medicine" which when taken in liberal quantities will produce intoxication, is an intoxicating liquor.—J. Am. Med. Assoc., 72 (1919), 1079. (W. A. P.)

Pelliform is a soap solution containing carbon tetrachloride used for skin troubles due to staphylococci.—(Pract. Dr.)

Periodol is a mixture of potassium hypochlorite, chlorine and iodine in combination with potassium chloride and potassium iodide. Dissolved in water containing carbonates it liberates chlorine and iodine. According to A. Sealo, its antiseptic action is due to the ease with which the nascent chlorine and iodine attack the protein material of the micro-organisms. Aqueous solutions of periodol can be made stable by the addition of 10 per cent. of sodium chloride.—Ann. igiene; through Chem. Abstracts, 13 (1919), 1352.

Phosphobion Pills, for nervous sleeplessness, contain zinc phosphide equivalent to 0.5 mgm. of phosphorus per pill.—Pharm. Weekblad, 56 (1919), 156. (H. E.)

Poal is a rat and mice poison.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Protargentum-Squibb.—A compound of gelatin and silver containing approximately 8 per cent. of silver in organic combination.

It has the actions and uses of silver preparations of the protargol type. Protargentum-Squibb is used in 0.25 to 5 per cent. aqueous solutions, prepared freshly as required.—J. Am. Med. Assoc., 72 (1919), 1543. (W. A. P.)

Psoralan is an eczema salve.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Pulvoids Calcyates Compound are tablets, each of which is said to contain "Calcium and Strontium Disalicylate 5 grs., Resin Guaiac $\frac{1}{2}$ gr., Digitalis $\frac{1}{4}$ gr., Colchium (colchicum) Seed $\frac{1}{4}$ gr., Squill $\frac{1}{4}$ gr., Cascarin $\frac{1}{16}$ gr. with aromatics." They were advertised among "Approved Remedies for La Grippe and 'Flu'" The Council on Pharmacy and Chemistry admits that salicylates have a field in influence in that they often afford relief from pain. There is no reason to suppose that a mixture of strontium and calcium salicylate—the calcium and strontium disalicylate of the "Pulvoids" is probably a mixture of strontium and calcium salicylates—has any greater salicylic effect than an equal amount of sodium salicylate. On the other hand it is worse than useless to give colchicum, squill and digitalis for the relief of such pain. No educated physician will give resin of guaiac and "cascarin" in fixed proportions with salicylates.—J. Am. Med. Assoc., 72 (1919), 1784. (W. A. P.)

Pyelon is a colloidal silver iodide preparation which when shaken with previously boiled water gives a colloidal solution. It is used in roentgenography of the urinary tract.—Pharm. Weekblad, 54 (1919), 1615. (H. E.)

Pyocæmine is a combination of alum and calcium chloride with thymol. It is used as a gargle and spray in the treatment of various throat and bronchial diseases.—(Am. Dr.)

Quinocol Tablets contain each 0.13 gramme of quinine guaiacol sulphionate and extract of *Piscidia erythrina* and is recommended for tuberculosis. Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Rectolin, for hemorrhoids, is an ointment containing esculin, adrenaline and cocaine. Pharm. Weekblad, 56 (1919), 156. (H. E.)

Rectosol Suppositories contain esculin, adrenaline, cocaine and a bismuth salt.—Pharm. Weekblad, 56 (1919), 156. (H. E.)

Resapon is a sulphur compound used in various forms, salve, soap, etc., in the local treatment of various skin diseases. It is marketed by the Reso Products Company, Zurich, Switzerland.—Am. Drug., 67 (1919), 97.

Restoria is sold as a cure for syphilis, but is also recommended for rheumatism, kidney trouble, lumbago, eczema and catarrh. The A. M. A. Chemical Laboratory reports that Restoria contains no mercury or arsenic but does contain iodide, probably as potassium iodide equivalent to 1.693 grammes per hundred mils. It also was found to contain much vegetable extractive, some alkaloidal drug and bitter oil or oleoresin.—J. Am. Med. Assoc., 73 (1919), 438. (W. A. P.)

Rhinovalein is a solution of valeryl-bromide in a medicated petroleum oil, used in the form of a spray in the treatment of inflamed mucous membrane, particularly of the nasal passages.—Pract. Drug., Apr., 1919, 36.

Rhamnototal is a cascara sagrada preparation. Pharm. Weekblad, 56 (1919), 156. (H. E.)

Rogonal.—An artificial cacao butter, melting at 35.8° C.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Rubino Healing Springs Lithia Water was found misbranded under the Federal Food and Drugs Act because it did not contain enough lithia to entitle it to the name "lithia water" and because of false claims as to its therapeutic value.—J. Am. Med. Assoc., 73 (1919), 1151. (W. A. P.)

Sajodin is the calcium salt of moniodobenzoic acid. Sajodin is used as a substitute for iodides. The iodine of sajodin, being longer retained is perhaps better utilized. It is also less liable to produce gastric disturbance than alkali iodides. Sajodin is also supplied as Sajodin Tablets 8 grains.—J. Am. Med. Assoc., 73 (1919), 1039. (W. A. P.)

Salcine Pills contain each 0.15 gramme of salol and 0.075 gramme of quinine.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Salvarsan Preparat No. 1495 is a stable not oxidizable solution of arseno-benzol-sulphoxylate.—Pharm. Weekblad, 56 (1919), 156. (H. E.)

Sanosin (first introduced as Sartolin) consists of a mixture of powdered eucalyptus leaves, flowers of sulphur, powdered wood charcoal, and oil of eucalyptus. The instructions to the consumptive are that this mixture should be placed on a slab under which an alcohol lamp is burning. The whole thing is to be operated in a room which is tightly closed and in which the consumptive is supposed to stay.—J. Am. Med. Assoc., 72 (1919), 1561. (W. A. P.)

Santheose consists of capsules each containing 0.5 gramme of pure theobromine.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Schade's Specific is a hydro-alcoholic solution containing sugar, aromatics, essential oils, licorice and bitter plant extractives. It has been declared misbranded under the Federal Food and Drugs Act.—J. Am. Med. Assoc., 73 (1919), 1157. (W. A. P.)

Scurocaine, made by the Usines du Rhône, is ethylcocaine hydrochloride.—Pharm. Weekblad, 56 (1919), 1615. (H. E.)

Sedacrin is a fluidextract prepared from several herbs, among these *Sedum acre*. It is used in the treatment of hemorrhoids.—Pharm. Weekblad, 56 (1919), 156. (H. E.)

Septacrol is a recent Ciba introduction. It is a combination of silver with an acridine dye, brilliant phosphin 5 grammes, the chemical name of which is dimethyldiaminomethylacridin nitrate. It contains 22 per cent. of silver and is used as a bactericide and antiseptic in 5 to 10 per cent. solutions.—(Am. Dr.)

Silver Proteinate-Heyden is a silver protein compound said to be identical with protargol. It is manufactured by the Heyden Chemical Works, New York.—(Am. Dr.)

Siphilidol (707) contains silver, antimony and arsenic and is used like salvarsan in the treatment of syphilis.—Pharm. Weekblad, 56 (1919), 156. (H. E.)

Sistomensin "Ciba" is the name given to a tablet medicine used in gynecological practice and representing an active portion of the corpus luteum.—(Am. Dr.)

Siwalin, or *pasta cacao-fina bismuthi composita*, is used for varicose veins.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Soy Bean Gruel Flour has approximately the following composition: protein, 44; fat, 20; sucrose, 10; ash, 4.3; fiber, 2; water, 4.6. Soy bean gruel flour may be used for preparing muffins. It is indicated in cases in which a diet relatively free from carbohydrates is desired, as in diabetes, amylaceous dyspepsia, etc. It has also been suggested for the diet in obesity.—J. Am. Med. Assoc., 13 (1919), 215. (W. A. P.)

Spencer's Chloramine Pastilles is a name applied for many years to lozenges containing ammonium chloride. Since the true chloramines have become so popular as wound antiseptics, the above use of the word "chloramine" is unfortunate and misleading. (J. A. M. A.)

Staphidine, which derives its name from the Greek word *staphos*, (meaning currant) is an extract of dry currants condensed to almost solid form by the heat-vacuum process. It is well-known throughout some districts of Greece, its great consumption being due to its successful use as a sugar substitute. It is furnished to the trade in Greece either in its natural dark-brown color or bleached. (Era.)

Sterilin is a solution of acetylcellulose in acetone. When poured on the hand, it forms a fine impenetrable non-sticky and resistant covering that serves as a substitute for rubber gloves or finger cots in surgical work. (C. A.)

Strumaval Tablets contain lipoiodine, quinine sulphate, silicic acid and calcium.—Pharm. Weekblad, 56 (1919), 156. (H. E.)

Strumaval Ointment contains potassium iodide and quinine sulphate.—Pharm. Weekblad, 56 (1919), 156. (H. E.)

Sudian is a medicated potash soap.—Süddtsch. Apoth.-Ztg.; through Chem. Abstracts, 13 (1919), 2962.

Sulfopinol is made by boiling 150 grammes of wood tar with 16 grammes of potassium hydroxide and a little water until saponification is complete. The resultant soap is dissolved in warm water and mixed with 75 grammes of wheat starch and the mixture is then boiled until a paste is obtained. After cooling add 150 grammes of sublimed sulphur and enough water to make 1000 grammes and mix thoroughly. Sulfopinol has the consistence of viscous liniment and has been used as a successful substitute for compound ointment of sulphur in a Stockholm hospital.—Svensk. Farm. Tid.; through Chem. Abstracts, 13 (1919), 633.

Sverol Pastillas contain menthol, eucalyptol, sugar, licorice and vanillin.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Tannin Albuminate Exsiccated is a compound of tannic acid and albumin thoroughly exsiccated and containing about 50 per cent. tannic acid in combination. It was first introduced as *tannalbin*. The use of tannin albuminate is based on the assumption that the tannin would pass the stomach largely unchanged, and thus the astringent action be exercised in the intestine where the compound would be decomposed by the intestinal fluid. It is used in diarrhea, particularly that of children and in phthisis.—J. Am. Med. Assoc., 72 (1919), 653. (W. A. P.)

Tartrostibias Anilini are needles containing a compound of tartaric acid, aniline and antimony trioxide. It is used subcutaneously in trypanosomatous conditions.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Tebecin Dostal is a vaccine from *Bacillus tuberculosis*.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Tetrahydroatophan is a crystalline substance obtained by reducing phenylquinoline carbonic acid. It is used for the treatment of spinal diseases.—Pharm. Weekblad, 56 (1919), 156. (H. E.)

Tetralin or **Tetrahydronaphthalene** is described pharmacologically in a paper by Pohl and Rawicz in the *Zeitschrift für physiol-*

ogische Chemie. The paper deals however chiefly with its fate in the organism and says little as to its therapeutic indications.—Chem. Abstracts, 13 (1919), 2089.

Tricalin is a combination of alkaline phosphates used in the treatment of acidosis and stomach ailments. (Am. Dr.)

Trichogen is described by E. P. Robinson as synthetic serum for promoting the growth of the hair. It is injected into the bald spot and stimulates cell proliferation, thus rejuvenating the atrophied hair cells and thus bringing about growth of hair in the natural way. (Am. Dr.)

Trusol is a compound solution of cresol containing 50 per cent. of cresol.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Tubbs' Bilious Man's Friend is a hydro-alcohol solution of sugar and plant extractives, notably rhubarb. It has been declared misbranded under the Federal Food and Drugs Act.—J. Am. Med. Assoc., 73 (1919), 1458. (W. A. P.)

"U. C. Extract" is claimed to contain "umekaloabo root" and "chijitse." The chemists of the British Medical Association found at the time when it was sold as Stevens' Consumption Cure, that it contained no active drugs except alcohol and glycerin.—J. Am. Med. Assoc., 72 (1919), 1918. (W. A. P.)

Uinctol is a preparation containing about 40 per cent. of extinguished mercury in a soap base. It was refused admission to New and Nonofficial Remedies, because of unwarranted therapeutic claims made by the manufacturers. (J. A. M. A.)

The Uri-Na Test, sold by the Standard Appliance Co., Philadelphia, bears a strong family resemblance to Capell's Urohuetic Test. Both are said to permit the detection of syphilis by an examination of urine. There is no method known at the present time by which the absence or presence of syphilis can be determined by a simple color test of the urine.—J. Am. Med. Assoc., 73 (1919), 1630. (W. A. P.)

Urtiarsyl, formerly *urtialfon* is a solution containing arsenic

trioxide and formic acid. It is recommended for gout.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Varnesis.—Some time ago the State chemists of Connecticut found this to contain 18 per cent. alcohol and less than 1 per cent. vegetable extractives derived from laxative drugs and capsicum. Later the alcohol percentage was reduced to 15.—J. Am. Med. Assoc., 72 (1919), 1560. (W. A. P.)

Ventrosan is a digestive remedy containing sodium and magnesium.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 2969.

Viavi.—Viavi capsules were analyzed for the California State Medical Journal and reported to contain nothing but extract of hydrastis and cocoa butter.—J. Am. Med. Assoc., 72 (1919), 1560. (W. A. P.)

Wildroot Dandruff and Eczema Cure has been analyzed by Dr. Harvey W. Wiley, who found it contained 40 per cent. of alcohol and less than one-half of one per cent. of non-volatile matter. The latter contained arsenic, a phenolic body, probably resorcin and a trace of alkaloidal material.—J. Am. Med. Assoc., 72 (1919), 594.

The Williams Treatment, according to its manufacturer, "conquers kidney and bladder diseases, rheumatism and all other ailments when due to excessive uric acid." It was analyzed in the A. M. A. Chemical Laboratory and from the results of the examination it was concluded that it is essentially a mixture containing in 100 mils 48 grammes of potassium acetate in solution and about 7 grammes of potassium bicarbonate, the latter being largely undissolved. The mixture is colored with caramel and flavored with oil of wintergreen or methyl salicylate. J. Am. Med. Assoc., 72 (1919), 1632. (W. A. P.)

Yadil is trimethenal-allyl-carbide. Renny states that when it was given during the first day or two of the attack of influenza there were no complications, all his patients made very satisfactory recovery. As a result the author wrote to ten doctors who had used this preparation in combating influenza. He received information of 1,623 cases of influenza treated with it, in about 915 of which it was given during the first or second day of the disease, and com-

plications developed in only six of these cases. The dosage varied between 15 minims and $\frac{1}{2}$ ounce; the majority preferred to give 1 drachm every three hours, or three times a day.—Lancet; through Chem. and Drug., 91 (1919), 453.

MATERIA MEDICA

A—GENERAL SUBJECTS

DRUG PLANT CULTIVATION.

Aromatic Plants.—*Cultivation in the United States.*—At the annual convention of the Manufacturing Perfumers' Association of the United States, P. H. Todd discussed the cultivation in this country of peppermint, and the possibility of the commercial production of lavender, rose, rosemary, geranium, orris, hyacinth, tuberose, jasmín, violet and jonquil. Experiments on the production of the last five are now being conducted at Mentha, Michigan.—Am. J. Pharm., 91 (1919), 437.

Drug Cultivation.—*In Argentina.*—J. A. Dominguez replies to an inquiry from the government in regard to the feasibility of cultivating the cinchona in Argentina. He advises starting with the *C. succirubra* as the hardiest species. If this succeeds, then others could be tried. Near the equator a high altitude is desirable. In Java the official plantations are at 1230 to 2350 meters but some private plantations are as low as 550 meters. All known plantations are above this altitude except in Australia where, although at an altitude of only 33 meters, the bark has yielded 6.5 per cent. of alkaloids. The *C. calisaya* seems to do best at an altitude of 2,000 meters. With higher altitudes the levorotatory alkaloids seem to increase while the proportion of dextrorotatory decreases. The cinchona plants can bear a temperature of 2° C. but at freezing point or below they are seriously injured, as also with very high temperatures. The admissible range is from 4 to 33° C. that is, a minimal average of 15° and a maximal average of 27° C. The rainfall has to be at least 1200 mm.; in the Java plantation the annual precipitation is 2300 to 4500 mm. with a maximal humidity of 96 per cent. There is no yield the first four years.—Semana Med.; through J. Am. Med. Assoc., 72 (1919), 461. (W. B. D.)

Drug Cultivation.—*In France.*—A committee of the Ministry of Commerce in France has been set up, under the presidency of Prof. Perrot, to deal with the collection and cultivation of medicinal plants. This committee has already made considerable progress. It has admitted that a considerable sum of money must be furnished to defray the expenses of experimental cultivation, etc., as a number of tropical plants could be grown in the French North African colonies, while for others the French climate would be suitable. Two pharmaceutical firms and one firm of chemical manufacturers have given subscriptions in support, which, with a subsidy that will be forthcoming from the State have enabled the committee to establish a programme for 1919. The work has been divided into several sections, and special reporters have been appointed to deal with definite questions.—Bull. Sci. Pharm.; through Pharm. J., 102 (1919), 346.

Drug Cultivation.—*In Germany.*—The Hortus Society has offered a prize of £50 for a chemical investigation on the principal constituents of shepherd's purse (*Capsella bursa pastoris*). The report of the investigation must be delivered before December 31, 1919, and must include a review of previous investigations and be accompanied by specimens of the substances isolated for pharmacological examination.—Schweiz. Apoth. Ztg.; through Pharm. J., 102 (1919), 219.

Drug Cultivation.—*In Holland.*—W. C. De Graaf gives an account of the results obtained in growing belladonna, henbane, stramonium, digitalis, valerian and peppermint. The quantity and quality were very satisfactory.—Pharm. Weekblad, 56 (1919), 1101. (H. E.)

Drug Cultivation.—*In India.*—Lucien Memminger reports that the price of jalap has risen considerably on account of the war. Jalap has been grown for many years in the Nilgiri Hills on the government cinchona plantations and there has been some increase in the stock during the past year. It has been found that the plant can be propagated by cuttings from the young climbing stems as well as tubers. In Ootacamund an acre of jalap yields 5000 pounds of green tubers equivalent to about 1000 pounds of powder.

Experiments with aconite, belladonna and ipecac have not been satisfactory but digitalis, hyoscyamus, mint, fennel and rosemary

are doing well. Experiments are being made with lobelia and chenopodium.—*Nat. Drug.*, 49 (1919), 9. (C. M. S.)

Drug Cultivation.—*In Indiana.*—F. A. Miller describes the results of the experiments conducted by the research departments of an Indianapolis firm.

Some of the drugs reviewed by the author are belladonna, cannabis and digitalis. He also mentions that uniformity of growth and character of plant are best obtained under artificial conditions of growth and facilitate collection and curing.—*Practical Druggist*, May, 1919, 27. (F. H.)

Drug Cultivation.—*In Michigan.*—E. L. Woodhams found that obtaining seed of high purity and germination was the first difficulty encountered in the cultivation of belladonna and henbane. The small supply obtained from American seedsmen has been nearly worthless. By careful selection of parent seed plants and propagation of those strains, seed 100 per cent. pure with 90 per cent. germination was produced.

The Colorado potato beetle can be treated with poison at first but near harvest time a stick and a pan of kerosene must be resorted to. The "jumping flea beetle" is so hard to combat that it is best to use new fields. Nicotine and "Black leaf 40" are recommended for aphid or potato louse.

Drying at constant temperature with circulation of fresh hot air by means of a steam-heated kiln gives a green product within 48 hours from gathering and prevents enzyme action which is thought to cause discoloration when the herb is dried slowly.

Woodhams believes discrepancies in analyses are due to method of selection of samples. Individual plants show a variation in alkaloidal content from 0.10 per cent. to over 1.00 per cent. and this peculiarity is transmitted to descendants. A fair sample cannot be obtained except by milling an entire bale, for each bale may show all stages of growth, collected in all sorts of ways. Testing the domestic product is easier because growth and selection are controlled. There is, however, a wide variation of alkaloidal content in different parts of the plant. In one assay the flowering tops, representing 8 per cent. of the plant contained 0.113 per cent. of alkaloid; small branchlets and leaves representing 41 per cent. of the plant, 0.123 per cent. alkaloid; stalk and coarse leaves representing $32\frac{1}{2}$ per cent. of the plant, 0.102 per cent. alkaloid. Their

method is to mix thoroughly 1000 pounds, make 20 bales of it, have one bale milled and analyzed and they have found it fair to buyer and seller.

They believe the small farmer will not go into drug farming to any extent for it requires too much capital. The supply will come from farms of pharmaceutical houses or from large growers.

The American drug industry can survive if a moderate duty is placed on the importation of foreign drugs.—J. Am. Pharm. Assoc., 8 (1919), 478. (Z. M. C.)

Drug Cultivation.—*Results in Norway and Sweden.*—Anderssen discusses the cultivation of angelica, hyoscyamus, belladonna, stramonium, valerian, verbascum, chamomile, peppermint and opium. The alkaloidal content of the cultivated solanaceous plants were higher than of wild grown samples. Norwegian opium assay 12.44 per cent. of morphine.—Norges Apot. Tidsskrift; through Chem. Abstracts, 13 (1919), 56.

Drug Cultivation.—*In Pennsylvania.*—George P. Koch in a paper read before the Philadelphia Branch of the A. Ph. A., after giving a brief history of drug plant cultivation, describes the economic conditions caused in drug markets by the war. He then outlines the present methods of growing *Atropa Belladonna*, *Hyoscyamus niger*, *Digitalis purpurea*, *Cannabis* and *Datura Stramonium*, which were most likely to be adapted to the State of Pennsylvania.—J. Am. Pharm. Assoc., 8 (1919), 275. (H. H. S.)

Drug Cultivation.—*In Scotland.*—By public subscription in Scotland, £16,000 has been raised, to be supplemented by a similar amount from the public funds, for the establishment of an Institute of Agricultural Botany. Research in drug plant cultivation and breeding is planned. England already possesses such an institute and Wales, through the munificence of one of her citizens, is soon to make a beginning.—Pharm. J., 103 (1919), 191.

Drug Cultivation.—*In the United States.*—W. W. Stockberger reports that during 1918 marketable quantities of belladonna, henbane, digitalis, cannabis, calendula and sage were grown and negligible quantities of senega, mandrake, pink root, valerian, cypripedium and blood-root. He gives also some statistics as to number of growers, their distribution and the amounts produced.—J. Am. Pharm. Assoc., 8 (1919), 807. (Z. M. C.)

A Strolling Herbalist.—Fred. B. Kilmer describes the crude drug markets, etc., as one would see them strolling along from East Cheap (London) through Grace Church, Crutched Friars, Chelsea, etc. He also described a visit to an English drug farm and their methods of procedure.—*Pract. Drug.*, Nov., 1919, 26. (H. H. S.)

BACTERIOLOGY.

Bacteriology.—*Informal Talks on.*—Under this title a most interesting and comprehensive series of talks on bacteriology run through the entire year.—*Bull. Pharm.*, 33 (1919), 22, 25, 65, 67, 103, 105, 152, 154, 196, 198, 247, 249, 281, 283, 324, 326, 372, 375, 424, 426, 460 and 463. (C. M. S.)

Bacteriology.—*In Ancient India.*—G. P. Kolokhe states that facts concerning bacterial diseases as well as descriptions of a few of the microscopical organisms were known centuries ago and that they are recorded in the Ayurveda "Science of Life."

The Indian belief in cleanliness as a prevention against disease is no less worthy of note than their knowledge of the theory of immunity.—*Bombay Chron.*; through *Pharm. Era*, 52 (1919), 308. (F. H.)

Bulgarian Bacillus.—*Commercial Cultures of.*—In this paper by Edgar B. Carter, "A short historical sketch iopens the paper to show that Metchnikoff did not originate the theory of the harmfulness of absorption of bacterial toxins from the intestines nor was the first to suggest the use of the Bulgarian bacillus in the treatment of these conditions. The bacteriological characteristics and the chemical changes produced in milk by the organism are taken up briefly, after which the three forms of commercial cultures are discussed. The advantages and limitations of each are shown. The paper closes with the description of the tests used to establish the values of the cultures with a simple test by which the pharmacist may satisfy himself as to their viability." A bibliography follows.—*J. Am. Pharm. Assoc.*, 8 (1919), 179. (Z. M. C.)

Culture Media.—*Filtration of.*—H. A. Noyes says that in his work he has found the following procedure quick and entirely satisfactory for media filtration. The time taken for filtration

and refiltration is almost always less than four minutes. Glass wool, and a six-inch funnel having a long stem (8 inches) with an outlet (bore) of about one-fourth inch, are used. A piece of glass wool (about $1\frac{1}{4}$ inches by $\frac{1}{2}$ inch thick) is placed inside the funnel over the outlet. The culture medium is poured in on this. The two things which recommend this method of filtration are: the adaptability of the glass wool as a filter, and the gravity pull exerted by having a long funnel stem always full of medium. The funnel is not allowed to become empty until the filtration and refiltration are finished, for it is often difficult to get the stem to fill up and exert its gravity pull a second time. The first liquid which comes through is rarely clear, and as soon as the medium coming through is as clear as desired, another flask should be put under the funnel and this first portion refiltered.—Chem. Anal.; through Am. Drug., 67 (1919), 313.

Litmus Solutions.—*Effect of Sterilization of Those Containing Sugar.*—V. Zotier discusses the use of these preparations in bacteriology and raises the question as to whether the heat required for sterilizations is sufficient. He experimented with sterilized litmus solutions containing glucose, lactose, maltose or saccharose, making cultures of paratyphoid B., Flexner's and Shiga's bacilli.

His conclusions were that twenty minutes of sterilization at 110 to 120° had no deleterious effect on the solutions employed.—J. pharm. chim., 20 (1919), 115.

Microbes.—*New Race Tolerant to Arsenic.*—Richet and Cardot state that by innumerable cultivations of strains of a lactic-acid-forming bacillus in an arsenical medium during a period of four months, daily observation showed that tolerance towards increased doses of arsenic was suddenly acquired on several successive occasions. Each of these occasions was indicated by a rapid and intense growth of the bacteria. Finally, the new race of microbes had become so adapted to the arsenical medium that they grew better therein than in the same medium without arsenic. In the last twelve cultures this increased multiplication was equivalent to 159, representing the growth in non-arsenical medium as 100.—Comptes rend.; through Pharm. J., 103 (1919), 142.

Tubercle Bacilli.—*Staining of.*—Lesieur, Jacquet and Pintenot dry the sputum smear and then cover it with the following stain: Powdered gentian violet, 1 Gm., is dissolved by triturating in a

mortar with alcohol (90 per cent.), 10 mls. When complete solution is obtained, sufficient aqueous solution of phenol, 1 : 20 is added to make up to 100 mls. After covering with this stain the preparation is kept over a low flame for three minutes; even if it is quite dried up it may still be used. Excess of stain is removed by washing with water, and discharged by means of a solution of 2 per cent., by volume, or 3 per cent., by weight, of lactic acid in strong alcohol. There is no danger of carrying the treatment too far, since the bacilli are quite resistant to the acid. When the violet color is discharged, the counter-stain, safranin, 1, in aniline water, 500, is applied. This stains the background reddish yellow, against which the blackish violet bacilli stand out sharply.—Comptes rend. Soc. Biol.; through Pharm. J., 102 (1919), 426.

GENERAL BOTANY.

Botanical Etymology.—F. Gagnepain discusses interesting the vagaries of botanical nomenclature, citing such generic names dedicated to distinguished men as *Jussiaea*, *Nicotiana*, *Newtonia*, *Baubimia*, *Linnaea*. Then he cites queer cognomial pleasantries as *Dedea* (after Baillon's pet name for his son, André) *Marcellia mirabilis* (after Baillon's little granddaughter Marcelle, "the admirable") and *Didiciea* (from the initials "D. D. C." of Dr. D. D. Cunningham). [To this might be added *Asagrea*, after Asa Gray.—Ed.] Then he gives a list of anagrams, such as *Microæna* and *Craniotome*; *Onagra* and *Anogra*; *Animirta* and *Mirtana*; of Latinized vernacular words, such as *Coffea*; of national words, such as *Punica*; of words designating locality, such *Ranunculus* ("growing where frogs are found;") of names suggesting medical use, such as *Pulmonaria*; of words designating classic worthies, such as *Centaurea*; and of word suggesting botanical characteristics, such as *Digitalis*.—Larousse mensuel; through J. pharm. chim., 2 (1919), 202.

Botanical Exploration.—A *Hobby for Druggists*.—E. W. Fellows recommends botanical sight-seeing trips as a good recreation for the druggist. This hobby is in line with their work, carries them away from the store routine and at times may be a source of profit as well as health.—Drug. Circ., 63 (1919), 365. (C. W. B.)

Botanical Nomenclature.—*Suggested Changes in.*—O. A. Farwell discusses the nomenclature of *Populus balsamifera*, *P. Tacamahacca*, *Veronica persica* and *Viburnum opulus* giving interesting historical data on the subject. The article should be consulted by all interested.—*Rhodora*; through *Pract. Drug.*, Sept. 1919, 28.

Mucilage.—*Origin in Plants.*—F. E. Lloyd finds that the mucilage in cacti, the mallows and tragacanth, arises within specialized parenchyma cells by hydrolysis of the cellulose wall, the wall by hydration, changing to hydrocellulose and then into mucilage. The mucilage shows lamination, which is determined by water content and is possibly predetermined by the opposite layers of cellulose in the original cell wall. The mucilage is not laid down as secondary layer, nor secreted within the protoplast, nor is it a secretion thrown out as mucilage from the outer surface of the protoplasm. The mucilage absorbs certain dyes with great vigor, others with less vigor, and others not at all.—*Am. J. Bot.*; through *Chem. Abstracts*, 13 (1919), 1333.

Green Plants.—*Phospho-organic Reserve Principle of.*—By heating inositol with phosphoric acid in the presence of phosphoric anhydride at 120–130° C. for three hours, inositol hexaphosphate has been synthesized and subsequently isolated as its double calcium sodium salt. The crystals of this salt and of the salt obtained from phytin have now been found to be identical. This is regarded by S. Posternak as conclusive proof that the phospho-organic reserve principle of green plants is inositol hexaphosphate.—*Comptes rend.*; through *J. Soc. Chem. Ind.*, 38 (1919), 695A.

Leguminosæ.—*Root-nodules of.*—E. R. Spratt has been able to distinguish five types of nodules containing the nitrogen-fixing organism, *Bacillus radicola*. The first kind is modified lateral roots and occurs exclusively in other families; the other four kinds are exogenous in origin and are characteristic of various subdivisions of the Leguminosæ.—*Am. Bot.*; through *Pharm. J.*, 102 (1919), 389.

Linen Tags.—*For Labelling Plants.*—For tagging plants, linen cloth is now being used. Writing on wooden tags soon becomes illegible, while copper tags are not only expensive, but are not

large enough for sufficient data. The linen tags are first soaked several days in water to remove the sizings and then dried and smoothed with a hot flatiron. Data are written with India ink, using a round pointed pen. The ink soaks in, but does not run. Such tags will last a year or longer. When they are to be used for longer periods or under conditions where the tags come in contact with the ground, they are coated with paraffin after labeling. One method is to dip them in a mixture of gasoline and paraffin (proportion, one quart of gasoline to one-half pound paraffin). The gasoline evaporates, leaving a film of paraffin. If the tags become coated with mud, they can easily be washed and the ink shows up clearly. Such tags may be used in a variety of ways, for when treated in this manner they last exceptionally well.—J. N. Y. Bot. Garden; through Am. Drug., 67 (1919), 131.

The New York Botanical Garden.—H. H. Rusby tells what is to be seen by the visiting pharmacist when touring the 400 acres of land which make up the New York Botanical Garden. Some of the beautiful spots mentioned by the author are the Rose Garden, plots of German Iris, the Systematic Herbaceous Garden, Student's Garden of Morphology, the Economic Garden, the General Fruticetum in the North Meadow, and last, but not least, the Museum Building with its wonderful library and plant collection.—Pharm. Era, 62(1919), 197. (F. H.)

Respiration of Plants.—*After Death.*—A. R. C. Haas states that the respiration of *Laminaria*, a brown seaweed, is considerably greater after it has been killed by alcohol, acetone, formaldehyde, and ethyl bromide, as well as by drying, immersion in running tap water for a day and other methods. This increase in the amount of carbon dioxide, given out, is probably due to the escape of the enzymes concerned in normal respiration. The formation of hydrocyanic acid by bruised bitter almonds is given as analogous.—Bot. Gaz.; through Pharm. J., 102 (1919), 412.

Roots.—*Absorption of Water by.*—As the result of a number of experiments, it is concluded that water is absorbed by growing roots solely by the apex, and not at all by the radicle hairs. This is quite contrary to the views generally held by plant biologists. H. Coupin considers that root hairs have only two functions. The

first is to protect the root from too rapid evaporation, which would be fatal to the plant. The second is to give support to the apex, and so allow it to penetrate as far as possible into the soil. When germination occurs in light, porous, slightly damp soil, the only roots which penetrate far into it are those whose root hairs have got a grip against particles of soil. The others, without this support of root hairs, grow more or less on the surface, and the extreme apex follows any anfractuosity it may meet, twisting and turning about in all directions. Numerous other experiments are quoted which support the hypothesis that root hairs absorb little or no moisture.—*Comptes rend.*; through *Pharm. J.*, 102 (1919), 389.

Trees in Medicine.—This article by J. Foote consists of short but interesting notes upon the many drugs and medicinal products obtained from trees, both indigenous and foreign. Historical, therapeutic and pharmacognostic data for the several drugs included forms the substance of the contribution.—*Amer. Drug.*, 67 (1919), 352. (C. W. B.)

Ultra-Violet Rays.—*Action on Plants.*—T. Tsuji finds that sugar cane, pine apple, and banana subjected to total darkness for 30 days had the deep green color restored to their leaves after treatment with ultraviolet rays while those exposed to the sunlight kept their yellow etiolated color.—*La. Planter*; through *Chem. News*, 118 (1919), 118. (F. H.)

Woody Plants.—*Food Reserves in.*—As the result of extensive investigations on the distribution of starch and fat in a large number of woody plants at various seasons, Sinnott concludes that during winter starch is commonest in regions remote from centres of production, and in cells with thick, well lignified, small pitted walls, and that fat is most abundant in and near the phloem, close to the vessels, and in cells with thin or unlignified walls or large pits. Where the movement of liquids is slow, starch predominates, and where such movement is easy, starch disappears at the beginning of winter, and fat is produced. It is suggested that the type of food reserve may be due to differences in the water content of the storage cells giving a modification of enzyme action or to differences in the ease with which enzymes have effective access to the storage cells.—*Bot. Gaz.*; through *Pharm. J.*, 102 (1919), 134.

GEOGRAPHIC BOTANY.

Aleppo and Damascus.—*Drug Products of.*—This is a description of the drug commerce which has its center in these cities. Colocynth, licorice, galls, scammony, tragacanth and spices are the chief articles handled and are brought by caravan to the markets of these cities. With extension of railroads at present building and contemplated this region is destined to regain the commercial importance and prosperity which prevailed in earlier times.—Pharm. Era, 52 (1919), 35. (C. W. B.)

American Botanical Drugs.—Many vegetable drugs accorded recognition in the U. S. and foreign pharmacopœias are native to American soil. The centers of greatest importance as natural sources of crude drugs are the Appalachian and Pacific Slope regions. Collecting in the former region is in the hands of mountaineers who depend upon experience rather than exact knowledge in their work. The produce is brought to the warehouses of large buyers or traded to storekeepers for necessary supplies. In cultivation of medicinal plants, climatic conditions must govern choice of the region selected for this work. Instances cited are those of peppermint in New York and Michigan, also camphor in Florida. The article includes an outline map showing habitat of plants producing American crude drugs and an alphabetic list of the native drugs.—Pharm. Era, 52 (1919), 63.

This contribution is supplemental to a previous article dealing with drugs native to North America. Those regions of Central and South America in which important vegetable drugs are produced are described. Brief notes on climatic conditions are given and the article includes both an outline map and an alphabetical list of drugs native to South America.—Pharm. Era, 52 (1919), 89.

The Blue Ridge.—*Botanicals of.*—War has brought American drug production into greater prominence. Since the Southern Appalachian region has been the chief source of American botanical drugs for several decades, the Bureau of Chemistry deemed it advisable to make a survey of the Blue Ridge region and C. O. Ewing and E. E. Stanford report some of the findings that are of general interest. They consider the topography of the three physiographic zones with the characteristic flora of each. The mountain zone furnishes possibly 75 per cent. of America's botanic drugs. Six

hundred or more species which have had medicinal application are to be found here. Most of these have fallen into disuse but a few still hold a high place in our *Materia Medica*.

The authors write interestingly of the history of the drug industries, particularly of the collectors and dealers of the present time. These people, of course, know their wares only by their common names, and some apparently unintentional substitution occurs, especially where considerable similarity exists. The manner of collecting and curing is described, names of drugs listed are given and prices are quoted. Generally speaking, drugs are not ground here but only gathered into wholesale warehouses. War conditions penetrated into even these remote regions, making a decided impress on the trade. The paper is most interesting and should be read in its entirety to be appreciated.—*J. Am. Pharm. Assoc.*, 8 (1919), 16. (Z. M. C.)

Burma.—*Products of.*—A series of articles dealing with the economic resources of Burma gives information concerning the following products of that province:

Cutch.—This is an extract from the wood of two species of *Acacia*, and is obtained by boiling chips of the wood with water and concentrating the extract until upon cooling it becomes solid. Gambier is a similar product obtained from the leaves of rubiaceous plants. Both are used in tanning and dyeing, especially for canvas exposed to water or weather, and for fishing lines and nets, as they counteract the action of salt water. Exports for past years (in tons) were:

1911-12	1912-13	1913-14	1914-15	1915-16
5,365	4,557	3,990	4,348	8,526

The 1917-18 exports fell off 30 per cent. Of this crop, the United Kingdom took the greater part, and the United States increased its purchases, while France took none.

Citronella Oil.—This industry was established in Burma in 1912, and in 1914 Burman citronella oil was recognized in the London market as being equal in quality to the Java and Ceylon oils. Analysis of three samples in 1913 showed geraniol contents as follows: 89.9 per cent., 94.7 per cent., and 90.1 per cent.

Jute.—It is stated that 1,000 tons of dry jute fiber per acre can be obtained by cultivation.

Hemp.—Sunn hemp is said to grow well. It yields a fiber valuable for making cordage, twine, canvas and fishing nets.

Hibiscus Cannabinus.—Is regularly cultivated, and yields 800 lb. to 1,000 lb. per acre of a fiber nearly the equal of jute in the manufacture of rope and cordage.

Sisal Hemp.—This is grown in Upper Burma, and is used in the manufacture of rope, cordage, carpets, matting, brushes and paper.

Aloes.—Mexican aloes and Mauritius green aloes are grown for the fiber which they produce. A fiber called *nagaset*, which is extracted from the leaves, is finer but weaker than sisal hemp.

A kind of hemp is also produced from a wild banana tree.

The pineapple is cultivated for its fruit, and it is suggested that the fiber from its leaves might be utilized as is done elsewhere.

Minerals.—The Tavoy district, three-fourths of which has never been explored, produces three-fourths of the world's supply of wolfram, besides tin and other minerals.

Proposed forest research is commended and a plea made that such research be extended to further exploit Burma forests.—Chem. and Drug., 91 (1919), 702, 736, 815, 842, 914. (K. S. B.)

Central Europe.—*Botanicals in*.—Efficiency and system once more: this time it is the rational systematic cultivation of medicinal plants for domestic and foreign use. Antonin Rolet, points out the many medicinal plants grown and sent away by Germany, Hungary, Austria, Bohemia and Croatia, not only to France, but to England, Russia and the United States. Rolet states Hungary has an experimental station of medicinal plants at Kolozyar with chemical therapeutical and pharmacological laboratories associated. At this station, instructors and priests take a course in raising botanicals, then these men in turn popularize their knowledge for the people under their charge. Coriander, rose for essence, *Claviceps purpurea*, were cultivated at this station; English peppermint and Japanese mint were acclimated. Central Hungary, Croatia and Slavonia export quantities of the root and leaves of belladonna. Austria has a national institute to encourage the cultivation of medicinal plants; both experimental stations in Austria, Rounberg and Prague have chemical, therapeutical and pharmacological laboratories associated with this cultivation. Some botanicals exported from Central Europe are aconite, anise, dandelion, digitalis, hyocymus, mint, sage, stramonium, angelica,

lycopodium, caraway, licorice root and many others.—Pharm. Era, 52 (1919), 283. (M. D.)

Chinese Vegetable Products.—Abstracts from a series of reports by J. Arnold, U. S. Commercial Agent at Peking. The subject matter comprises commercial and economic data on the following products: anise, apricot kernels, bamboo, beans, camphor, cassia bark, castor oil, cotton, ginger, ramie, licorice, peanuts, sesame, vegetable tallow, varnish and wood oil. Each topic is treated at length and export figures are given.—Chem. News, 119 (1919), 228. (C. W. B.)

Chinese Dye-Stuffs.—The native dye industry of China and the various vegetable dyes employed by the Chinese are now figuring in the export trade of that country. Of first importance is indigo, an acre of ground, under good crop conditions producing about 60 pounds of pure indigo. The plants are cut before flowering, steeped in cold water for some days, and well stirred. After the plants are removed from the water it is again stirred and slaked lime added to precipitate the dye. Chinese blacks are produced for the most part from gall nuts, the fabrics having first to be dyed blue. Yellow is produced from the flower buds of the locust tree (*Sophora japonica*), which are baked to a light brown color, placed in cold water, and brought to a boil. Alum is used as a mordant. The powdered roots of *Curcuma longa* or turmeric are also used for a yellow dye, especially for cotton fabrics. Red is produced from safflower, balsam (*Impatiens balsamina*), *Anchusa tinctoria*, and *Lawsonia alba*, the last named producing the rouge used by women. Green dyes are produced from the bark of *Rhamnus parvifolius*, *R. tinctorius*, and other species of the buckthorn. Brown dyes come from the false gambier, grown in Southwestern China, while the darker browns are produced by the addition of gallnuts and alum. The vegetable dyes of China are particularly well suited to Chinese rugs, and it is said that the dyes will outlast the rugs.—Pharm. Era, 52 (1919), 100.

Highland Household Remedies.—In a paper under this title, Alexander McCutcheon gives the following data concerning various herbs used in highland homes in the treatment of disease:

Liubh Mor (The Great Plant), or Tri-Blileach (Three-leaved).—*Menyanthes trifoliata*.—Buckbean.—Most highly prized plant

in the district. A fresh infusion, 4 ounces to 1 pint, used as stomachic, bitter and tonic. A home-made beer, buckbean replacing hops, was stored away for use as required.

Lus Au Calbain, or Righeal Cine (Plant for the hives); *Geranium Robertianum*; Herb Robert.—A fresh infusion, 2 ounces to 1 pint, used for the hives.

Fliogh.—*Stellaria Media*.—Chickweed.—A pulp made by bruising the entire plant used as a soothing poultice for inflamed or suppurating breasts.

Burmaid.—*Artemisia absinthium*.—Wormwood.—An infusion, 2 ounces dried herb to 1 pint, used as a vermifuge.

Grafan Ban.—*Marrubium vulgare*.—Horehound.—An infusion, 4 ounces to 1 pint, used as demulcent cough remedy. Patients suffering from a cold are confined to bed, given oatmeal gruel with butter, salt and pepper, and spruce beer made by fermenting a solution of molasses with spruce twigs, to reduce fever.

Stam Lus (The Healing Herb).—*Plantago lanceolata*.—Plantain.—The fresh leaves used as a styptic for small wound and abrasions.

Dockran.—*Rumex obtusifolius*.—Dock.—The succulent mucilaginous poultice obtained by crushing the fibrous tissue of the peeled thick root-stock used to allay the inflammation caused by bee or nettle stings.

Although described as infusions, most of the above remedies were so made as to be in reality decoctions, according to the author.

A plaster made by spreading on linen a mixture of beeswax, lard and a resin obtained as an exudation from various species of *Pinus* is used for boils and sores.—Chem. and Drug., 91 (1919), 386. (K. S. B.)

Jamaica.—*Products of.*—Among the exports from Jamaica during 1917 were the following: Annatto seed, 737,974 lb.; beeswax, 58,459 lb.; divi divi, 7,848 lb.; ginger, 20,965 cwt.; honey, 167,995 gal.; lime-juice, 78,365 gal.; logwood extract, 26,487 packages; pimento, 80,716 cwt.; logwood, 35,794 tons; fustic wood, 4,606 tons; quassia, 1,052 tons.—Chem. and Drug., 91 (1919), 843. (K. S. B.)

Mexico.—*Some Botanicals of.*—Among Mexico's drugs little known outside of that country are: Cachuananche, *Licana arborea*, yielding a seed-oil; azafrancillo, *Carthamus tinctoria*, cultivated in Michoacan; chia, *Salvia polstachya*, an oil plant; chavacano,

Prunus armeniaca, used as a flavor and yielding an oil like almond oil; aguacate, *Persea gratissima*, or alligator pear; mamey, *Lucuma mammosa*, yields an oil used as a hair-grower; mezquites, yielding a gum-like acacia; panete, *Plumbago pulchella*, containing a caustic principle acting like iodine; tabaquillo oloroso, *Hedeoma piperita*, yielding an oil containing over 50 per cent. of menthol; and raiz de ozo, or beer root, the Mexican valerian.—Pharm. Era, 52 (1919), 58.

Philippines.—*Some Medicinal Plants of.*—A. H. Wells reports that the dry wood of *Arcangelisia flava* contains 4.8 per cent. of berberine, probably a higher percentage than any other Philippine plant. The wood contains only small amounts of extractive matter, and the isolation of the alkaloid is therefore simple and inexpensive, and the plant forms an excellent source of the drug. The rhizome of *Geodorum nutans* contains about 14 per cent. of a water-soluble gum. *Coriaria intermedia*, known in New Zealand as "foot plant," contains a poisonous glucoside in its leaves and fruit.—Philipp. J. Sci.; through J. Soc. Chem. Ind., 38 (1919), 791A.

Switzerland.—*Cultivation of Rhubarb and Licorice in.*—Tschirch draws attention to the localities in Switzerland, where the cultivation of rhubarb and licorice would probably succeed. *Rheum tanguticum*, which yields the best rhubarb, is a mountain plant, and would probably flourish in open woods at an elevation of 2,000 to 3,000 meters. From a well grown plant it would be quite easy to take every year from twenty to thirty or more lateral rhizomes for cultivation, so that a few plants grown in an experimental garden would provide a large number of new plants every year. *Glycyrrhiza glabra*, on the other hand, flourishes in wide valleys on the banks of rivers that frequently overflow. The delta of the Maggia, on the Lago Maggiore, near Locarno, would be an ideal spot, as it is at present quite uncultivated. If the cultivation were commenced now, the canton of Ticino could in ten years' time supply the whole world with licorice, as the cultivation is simple and the multiplication of the plants very rapid.—Schweiz. Apoth. Ztg.; through Pharm. J., 102 (1919), 134.

DRUG COMMERCE.

American Botanicals.—*Cause of Shortage.*—It is stated that the shortage and consequent high price of American botanicals is due

to lack of labor to gather the crops. In many places less than 2 per cent. of the collectors who left to join the army have returned from the cities. High wages paid for help in road building is also given as a cause of the shortage of collectors.—Chem. and Drug., 91 (1919), 1260. (K. S. B.)

Crude Drugs.—*Distribution of.*—H. H. Rusby urges that wholesale drug commerce be regulated by enactment of a law requiring employment of a qualified pharmacognosist in establishments dealing in crude drugs. It is proposed that these pharmacognosists be licensed and be responsible to both the State and their employers. The article concludes with a resolution covering the salient points and calling for an amendment to the New York State Pharmacy Law to provide such regulation.—Drug. Circ., 63 (1919), 311. (C. B. W.)

Crude Drugs.—*Effects of War on Imports of.*—The drug industry gets its raw material from many sources and a war embracing practically the whole world necessarily affected amount and character of crude botanicals. Some have been altogether cut off, some affected a little, some have actually increased so that the actual tonnage decrease is not as large as has been imagined. To indicate in a comparative way the result of war conditions, C. L. Alsberg, A. Viehover, and C. O. Ewing, have prepared a table showing imports, declared value per pound, and wholesale price of selected grades of the following drugs for each of the years 1913 to 1919, inclusive: cinchona, coca, ergot, gentian, ipecac, jalap, licorice, nux vomica, opium, orris, rhubarb, sarsaparilla, senna, tragacanth, and vanilla.

The shortage in some crude drugs has stimulated drug cultivation in America and Japan. War conditions affected routing, causing shipments in small quantities from little known ports.

Adulteration is of two sorts—authentic material of poor quality, due to careless collection and spurious material. They believe that intentional sophistication is uncommon, either when it is an admixture or when offered alone. The collector may be ignorant, or if the adulterant is very different in appearance it may have been found to be valuable for similar purposes. However, the adulterants are frequently worthless.

New products appearing in this way are of much interest and they have classified them as follows: material containing toxic

foreign matter; material of value as substitutes for recognized products; material unsuitable for use as substitutes for recognized products, but valuable for other purposes; material of uncertain value, requiring further study; material of no known value. Descriptions and characteristic differences are given and in some cases, distinguishing tests. The paper contains much very valuable information which cannot be reduced to a few brief statements but must be read in its entirety to be appreciated.—J. Am. Pharm. Assoc., 8 (1919), 459. (Z. M. C.)

Drug Market.—*Review of.*—Harry B. French recalls the trend of affairs since the armistice. Political and economic agitation in Europe and the indisposition to work have demoralized reconstruction efforts. Lack of raw material in some sections has aggravated the trouble. Demands of foreign buyers have been so great that business has reached an extremely high tension. Depreciation of foreign money is considerable. Increased production and purchase of only necessities will prove the only remedy for present conditions. While excessive issues of money remain in circulation there can be little relief from expansion of prices.—J. Am. Pharm. Assoc., 8 (1919), 843. (Z. M. C.)

Dyes.—*British Imports.*—A detailed census of the dyes imported by Great Britain during 1913 showed the following kinds and quantities in the total:

Direct cotton colors.....	6,976,435 lbs.
Union colors.....	115,794 lbs.
Acid wool colors.....	5,223,101 lbs.
Chrome and mordant colors.....	6,477,065 lbs.
Alizarine.....	2,467,489 lbs.
Basic colors.....	1,599,074 lbs.
Sulphide colors.....	3,923,483 lbs.
Synthetic indigo.....	3,830,483 lbs.
Vat colors.....	588,445 lbs.
Oil, spirit, and wax colors.....	42,253 lbs.
Lake colors.....	1,082,079 lbs.
Intermediate products.....	7,467,795 lbs.
Unclassified.....	277,872 lbs.

Total	40,071,368 lbs.
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—Chem. and Drug., 91 (1919), 227. (K. S. B.)

St. Lucian Exports.—Among the exports from St. Lucia during the past three years were the following:

		1915	1916	1917
Molasses and syrup.....	gal.	17,000	108,107	78,310
Cacao.....	cwt.	18,478	14,575	11,716
Concentrated lime juice....	gal.	17,834	16,823	11,199
Raw lime juice.....	gal.	5,182	1,280	12,177
Distilled lime oil.....	gal.	363	305	300
Hand-pressed lime oil.....	gal.	385	294	145
Honey.....	lb.	29,338	45,588	46,724
Beeswax.....	lb.	274	303	96
Nutmegs.....	lb.	2,719	838	2,315
Mace.....	lb.	518	62	132
Vanilla.....	lb.	342	573	.....
Kola.....	lb.	.....	1,920	1,360
Bay oil.....	gal.	115	606	616
Logwood.....	cu. ft.	12,150 tons	790 tons	735

—Chem. and Drug., 91 (1919), 66. (K. S. B.)

MICROSCOPY AND HISTOLOGY.

"Acrid Principle" of Certain Plants.—Brown and Anderson have examined a number of plants as to the existence in them of a so-called "acrid principle" to which is ascribed an irritating effect. Being unable to find any volatile irritant, they turned their attention to mechanical factors. Plants like the Indian turnip, species of colocasia, skunk cabbage and pokeroor contain abundant raphides of calcium oxalate. It is these needle-like crystal masses that produce the irritation referred to. Any procedure that disintegrates the acicular structures decreases their capacity to produce irritation. This may happen through boiling; hence the supposition of volatility of the irritant substance. The degree of so-called acidity is governed by the physical character of the crystals and the nature of the plant tissues in which they are embedded, those plants containing the long, very slender crystals being much more acrid than those in which the crystals are shorter and thicker. The penetration of the raphides of calcium oxalate in a mechanical way can produce a fiery and painful irritation.—J. Pharmacol.; through Drug. Circ., 63 (1919), 92.

The foregoing observations are confirmed by H. W. Wiley,

who cites his paper on the subject published in 1903.—J. Am. Med. Assoc.; through Drug. Circ., 63 (1919), 92.

Gelatin Mounts.—*Stabilizing.*—After mounting the section in glycerinated gelatin and allowing the amount to solidify, E. Klemm places the slide in a glass dish with overlapping cover, at the bottom of which a few grammes of paraformaldehyde are loosely folded in tissue paper. The dish is then placed for several days in an oven kept a few degrees below the melting point of the glycerinated gelatin. The formaldehyde vapor produced not only hinders the introduction of micro-organisms but also hardens the gelatin, making a lacquer ring unnecessary.—Mikrokosmos; through Chem. Abstracts, 13 (1919), 2968.

Iron.—*Microchemistry of.*—J. Mawas uses hematoxylin and brazilin as reagents for detecting iron in the tissues. Hematoxylin colors cells containing iron a deep blue block, while brazilin gives with iron a brown color. The iron-hematoxylin stain may be confused with the stain that hematoxylin gives the normal cell nucleus, but this is not the case with brazilin, the violet red stain of the cell nucleus being quite different from the brown iron-brazilin lac.—J. pharm. chim., 19 (1919), 266.

Microchemical Assays.—L. Kofler discusses the micro-detection of hydroxymethyl anthraquinone in such drugs as rhubarb, senna, cascara sagrada and *Rhamnus carniolica*. He finds micro sublimation the simplest method; rhubarb, buckthorn and *R. carniolica* yielding a sublimate of yellow needles, while senna and cascara yield a yellowish sublimate with round crystalline masses. Both sublimates turn red on addition with alcoholic potassium hydroxide.—Z. Oesterr. Apoth. Ver.; through Chem. Abstracts, 13 (1919), 2968.

Microchemical Tests.—*For Certain Synthetics.*—L. van Itallie and A. L. W. E. van der Veen report that veronal can easily be identified microscopically by the characteristic forms of some of its double salts. The veronal is isolated in the usual way and to the alkaline solution either an acid salt or an ammonium salt, preferably ammonium phosphate, are added. The various forms of these double salts are described. The same methods can be applied for luminal and propional and here too the best results are

obtained with ammonium phosphate.—Pharm. Weekblad, 56 (1919), 1112. (H. E.)

Microchemistry of Plants.—*Study of Cystolites.*—H. Molisch states that all of the cystolites examined by him possess the property of reducing silver nitrate or silver sulphate so strongly that they become blackened after a short time. The deposition of silver is due to calcium carbonate which encrusts the cystolites, and the action provides a confirmatory microchemical method of detecting calcium carbonate in the plant. Cystolites become colored red to bluish violet in gold chloride solution, rust-red in ferrous sulphate, pale green in nickel sulphate, and lilac or pink in cobalt chloride or cobalt sulphate; the colorations are due to the precipitation of the corresponding hydroxides by calcium carbonate.—Ber. dtsch. bot. Ges.; through J. Soc. Chem. Ind., 38 (1919), 337A.

Poisons.—*Microchemical Detection of.*—O. Tunmann continues his fine work in this direction discussing in this paper the microchemistry of those substances extractable from acid aqueous solutions by means of ether, including colchicine, caffeine, theobromine and mercuric chloride. For details the original paper should be consulted.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2967.

Vegetable Adulterants.—*Microchemical Determination of.*—Fanchon Hart describes this method as worked out on whole pepper fruit. Shell and kernel were separated and each reduced to No. 80 powder. Microscopic examination showed the shells to be mostly sclerenchymatic tissue while the kernels were largely starch. A mixture of the two powders was used for quantitative analysis, the measurements being made by means of an ocular micrometer together with a stage micrometer. Areas of sclerenchymatic tissue were entered in one column and starch masses of the kernels were entered in another column. The total amount of sclerenchymatic tissue divided by the sum of it and total starch gives the percentage of shells in whole fruit. Miss Hart subjected her method to repeated tests and various checks which proved its accuracy. The results of determinations of pepper, colocynth buchu and saffron are given.—J. Am. Pharm. Assoc., 8 (1919), 1031. (Z. M. C.)

Woody Tissue.—*Staining of.*—P. Bugnon finds that a saturated solution of brilliant green and Soudan III in 70 per cent. alcohol is an effective staining agent. It colors lignified tissue green and cutinized and suberized tissue orange.—*Compt. rend.*; through *J. pharm. chim.*, 19 (1919), 193.

PHARMACOLOGY AND THERAPEUTICS.

Anesthesia.—*Treatment of Cholemia Following.*—At a meeting of the Société de Biologie, L. Chevrier reported that he found that the initial cholemia resulting from anesthesia by chloroform or ether could be lessened by giving the patient considerable sugar before the operation, while the secondary cholemia can be diminished by administering glucose for several days after the operation. Injections of morphine, he found worse than useless in such cases.—*J. pharm. chim.*, 20 (1919), 78.

Anthelmintics.—The earthworm reacts with symptoms of toxicity of all clinical anthelmintics just as do the parasitic intestinal worms. This fact has enabled Torald Sollmann to reinvestigate the claims long made for certain drugs. *Spigelia* was found to have rather feeble toxicity, but fresh pumpkin seed and squash seed were quite highly efficient.—*J. Am. Med. Assoc.*, 72 (1919), 1228. (W. A. P.)

Antiseptic Medicaments.—*Bacteria in.*—R. Durand examined a number of antiseptic powders used in dusting wounds and found in many pyogenic bacteria. He therefore advocates the sterilization of such powders prior to application to the wound.—*Bull. sci. pharmacol.*; through *Chem. Abstracts*, 13 (1919), 1742.

Bee Sting.—*A Test to Determine Safety of Anesthesia.*—It is stated that should a bee sting upon the hand cause a large swelling and affect the glands of the body the patient should not be given an anesthetic. The presence of a certain form of nervous disorder is indicated, rendering an anesthetic dangerous.—*Chem. and Drug.*, 91 (1919), 865. (K. S. B.)

Chilblain.—*Use of Ultraviolet Rays for.*—Levin reports on the treatment of certain obstinate cases of chilblain, occurring in the winter of 1917-1918. After failing to give relief with the ordinary

methods, he was led to try the application of the ultraviolet rays, from which he had most satisfactory results. Three of these cases are reported, and he suggests this method for the treatment of these sometimes very troublesome conditions. The violet and ultraviolet rays produce a minimum of heat but have marked chemical effect. The good results are probably due to the direct effect of the rays on the peripheral circulation, and he therefore suggests that they be employed, but not to the exclusion of other local and general measures.—J. Am. Med. Assoc.; through Drug. Circ., 62 (1919), 284.

Disinfectants.—*Relative Activity of.*—H. Friedenthal in studying the potency of disinfectants, found that the absolute disinfecting power was in each case measured by the volume of nutritive medium maintained in an absolutely sterile condition by 1 gramme of the agent employed. A large number of disinfectants were examined and a classification made in the order of their disinfecting action and their relative cost. At the head of this list are found formalin, colloidal mercury preparations, mercuric chloride and hydrogen dioxide. Phenol and phenol derivatives were found to be relatively more expensive. Formalin and naphthol were found to be of much more service than phenol and lysol. A classification of the relative disinfecting actions of the toxic dose of a large number of substances are given, hydrogen dioxide and mercuric chloride being found more powerful.—Biochem. Z., 94 (1919), 47. (G. C. D.)

Disinfectants.—*Standardizing.*—S. Rideal describes the standard bacteriological test adopted by the British Disinfectant Manufacturers Association, as follows: Shake the bottle or other vessel containing the disinfectant well before proceeding to make the dilution. Make a 1 per cent. stock emulsion (5 mls of disinfectant added to 495 mls of boiled distilled water of 15° C. to 18° C. From this stock emulsion prepare required dilutions in boiled distilled water, taking care that pipettes used for preparing stock emulsion as well as dilutions are, after emptying, always well washed out with and into the diluent, and that all dilutions, including stock emulsion, are well shaken before use. To 5 mls of a particular dilution add 0.2 mil (five drops) of a broth culture of *B. typhosus* grown for twenty-four hours at 37° C. Shake immediately after medication. Keep medicated tubes at temperature of 15° C. to

18° C. and take sub-cultures into 5 mls broth every two and a half minutes up to ten minutes. Incubate for at least forty-eight hours at 37° C. Use as stock organism *B. typhosus* from a single colony on an agar plate culture that has been grown at 21° C. to 22° C. from two to seven days and removed by weekly transference for several uninterrupted generations from the original source (the human body).

It is of extreme importance that the broth be prepared as follows:

Leneco, 20 grammes; peptone (Allen & Hanbury's "Eupepton"), 20 grammes; sodium chloride, 10 grammes; water to 1 liter. Boil the mixture for thirty minutes, neutralize with normal caustic soda (phenolphthalein indicator), add 15 mls of normal hydrochloric acid; make up to 1 liter with distilled water, filter and finally sterilize.—Brit. Med. J.; through Am. Drug., 67 (1919), 351.

Edulcorants.—*Chemistry of.*—By this word, Barral and Ranc designates those chemicals which produce a sensation of sweetness to the palate. The authors group such bodies into: (a) halogen compounds, such as chloroform; (b) aromatic nitrogen compounds, such as mononitrobenzene; (c) alcohols, such as mannitol and the carbohydrates; (d) polyphenols, such as resorcinol; (e) amino acids, such as glycocoll; and (f) amides, such as glucin and saccharin. The article closes with a discussion of the structure of these latter commercial sweetening agents.—Rev. Sci.; through J. pharm. chim., 19 (1919), 181.

Gall Stones.—*Note on Crystallized.*—H. Claassen describes bodies passed by a woman 45 years of age as small grains, several as large as a pea. Color yellowish, somewhat shining. Heated on platinum foil they melted at first, then evaporated, leaving a small amount of a dark substance that ignited and burned with a yellow flame. Soluble in hot alcohol, the solution leaving, when evaporated on a slide, four-sided rhombic plates; the largest crystal, being polyhedral with a diameter from 6 to 10 millimeters and weighing up to 0.384 gramme. One weighed 0.208 gramme and surpassed the others by its quite regular shape; it belonged to the regular (tesseral) crystal system, being a combination of the predominant cube with the octahedron and the dodecahedron, proven by measuring its angles with hand goniometer. The

above mentioned properties belong to cholestrin which the bodies undoubtedly represent.—*Am. J. Pharm.*, 91 (1919), 164.

(J. K. T.)

Hay Fever.—*Use of Pollen Extracts in.*—A. W. Lescohier discusses the cause of hay fever and the reasons for the high degree of susceptibility in some individuals. He believes that most cases are due to infection by two pollens. Those cases coming earlier in the year, being due to grass pollen, and those coming later to rag weed pollen. His observations lead him to the conclusion that a large percentage of hay fever cases may be relieved by the use of pollen extracts.—*Bull. Pharm.*, 33 (1919), 158. (C. M. S.)

Hay Fever.—*Goldenrod not Responsible for.*—In spring hay fever is caused chiefly by the pollens of grasses. The fall hay fever in the Northern, Eastern and Southern states is for the most part attributed to the pollens of the ragweeds. In the Pacific and Rocky Mountain states they are replaced by the wormwoods. Scheppegegrell has concluded that goldenrod does not cause hay fever.—*J. Am. Med. Assoc.*, 72 (1919), 1162. (W. A. P.)

Influenza.—*Electrolytic Disinfection in.*—F. W. Alexander describes the method of disinfection employed at Poplar, England. The drawbacks to using chlorinated soda on a large scale are that it is difficult to make and has to be freshly prepared. The electrolytic fluid as made in Poplar contains common salt and hypochlorite of magnesium (a solution of chlorinated magnesium), it is alkaline and stable, and if it is necessary to give it a tint permanaganate of potash may be used for the purpose, as it retains its color when added to the solution. During the first three weeks of November, 5370 gallons were distributed free in the borough, the cost, including that of electricity and materials, being 1/2 d. per gallon (or about £12 per 5370 gallons). This fluid has been available free in Poplar for the last twelve years, and as soon as influenza broke out in the borough handbills were distributed and the district posted with bills instructing the inhabitants to rinse the mouth, gargle the throat, and douche the inside of the nose with the council's electrolytic disinfectant, which could be procured free at one of the council's seven distributing depôts. Mr. Alexander points out the advantages of installing plants for making the fluid, especially on ships and at seaside towns, where the electrolyte is always at hand and always ready. It could be used immediately in out

breaks of diphtheria and cerebro-spinal fever.—*Lancet*; through *Chem. News*, 119 (1919), 48.

Influenza.—*Treatment with Quino-Arsenical Serum.*—At a meeting of the Paris Academy of Medicine, A. Gautier recommended for infectious grippe, hypodermic injections of the following preparation:

Sterile physiologic saline (8 grammes per 1000).....	400 mils
Quinine hydrochloride.....	0.50 gramme
Arrhenal (dimethylarsenate of soda).....	0.05 gramme

Drs. Variot and Robin testified to the efficacy of the preparation.—*J. pharm. chim.*, 19 (1919), 127.

Influenza.—*Unsuccessful Attempts to Transmit.*—Two extensive attempts have been made under the auspices of the U. S. Public Health Service and the U. S. Navy to transmit influenza experimentally. Inoculations were made of pure cultures of the influenza bacillus, of secretions of the upper air passages in the early stages of influenza, and of blood from typical cases of influenza, and other methods of transmitting the disease were tried. In no case was influenza developed.—*J. Am. Med. Assoc.*, 72 (1919), 281.

(W. A. P.)

Goiter.—*Prevention of Simple.*—O. P. Kimball, J. M. Rogoff and D. Marine publish their third paper on the effect of sodium iodide in the prevention of goiter in school children. They conclude that simple goiter in man may be prevented and that the method may be carried out as a public health measure. Two grammes of sodium iodide given twice yearly seems adequate for the purpose.—*J. Am. Med. Assoc.*, 72 (1919), 1873.

(W. A. P.)

Inhalants.—*Dangerous.*—The harmful effects of the promiscuous inhalation of creosote or eucalyptus oil, widely practised in Australia by the public as a preventive against infection during the lately prevalent influenza epidemic, have been alluded to recently by Dr. R. P. McMeekin, the medical superintendent of Melbourne Hospital. Instead of being a preventive, this habit has caused an inflammatory condition of the nasal mucous membrane. In many

cases this would predispose the individual to infection rather than obviate it. Cases of laryngitis and coryza, entirely due to the use of creosote or eucalyptus oil on the masks worn by the persons affected, have been met with at this hospital.—Austral. J. Pharm.; through Pharm. J., 102 (1919), 389.

Lice.—*Destroying.*—It is stated that three varieties of lice attack man in the Army, *Phthirus Pubis*, *Pediculus humanus* and *Pediculus corporis*: *Pediculus corporis* associated with the clothing and bedding has been hardest to eliminate, the other two may be finally disposed of by close clipping of all hair. So far, heat seems to most efficacious and cheapest method of eradicating *Pediculus corporis*. The methods are used:

(1) *Dry heat*, unbundled material exposed twenty minutes to 55° C.

(2) *Steam*, more expensive, requires higher temperature 65° C.—70° C.

(3) *Hot water*, use enough without chemicals.

As yet, the vapors of sulphur dioxide or of hydrocyanic acid gas are both expensive, slow in action and require skilled application to kill all nits, and are dangerous. A useful fluid to destroy both lice and nits in clothing is an emulsion of soap water, crude carbolic acid, cresol, tar and wood oils. Immerse clothing five minutes at about 5° C. Besides these immersions each man could be issued a paste to apply to skin made of crude "unwhizzed" naphthalene plus soft soap or petrolatum in proportion of 10-20 per cent. An anti-lice paste for hair clad surface can also be made of petrolatum and 1/2 per cent. veratrine dissolved in 5 per cent. benzin. In checking lousiness in the army, trench fever and its resultant waste of life will be checked.—Am. Drug., 67 (1919), 53. (M. D.)

Light.—*Relation to Health.*—Charles E. De M. Sajous in paper read before the Philadelphia Section of the Illuminating Engineering Society, discusses the relation of light and its action to the carrying out of the various functions of the organs and enzymes found in the body. He concludes by remarking that light is intimately bound up with the perpetuation of life, whether the tissues be normal or diseased. It tends to sustain health by promoting, as radiance energy, the activity of the oxidizing ferment adrenoxidase, which sustains the oxidation of tissue cells, an essential function of their life. It tends to defend the cell, when endangered by

certain germs and poisons, by enhancing through the heat energy developed the efficiency of the defensive ferments which submit these harmful agencies to digestive destruction.—J. Am. Pharm. Assoc., 8 (1919), 617. (H. H. S.)

Local Anesthetics.—*Behavior of.*—Eggleston and Hatcher find that the fatal intravenous dose of each of the several substitutes for cocaine varies enormously with differences of rate of injection. Subcutaneous doses show even wider variations among the different drugs than intravenous doses. All of the local anesthetics tested, including cocaine, are mutually and quantitatively synergistic. They are all synergistic with epinephrine in its effect upon the blood pressure in a manner analogous to cocaine. The systematic toxic actions of all of the members of the group are very closely alike and all cause death in cats by combined paralysis of the heart and respiratory center. Three of the members of the group (procaine, stovaine and apothesine) have been shown to be destroyed rapidly by the liver. All of the others are rapidly destroyed in the animal body, excepting cocaine, and it seems probable that this destruction also takes place in the liver. Artificial respiration alone, or combined with cardiac massage, does not suffice to permit recovery from the sudden intravenous injection of 125 per cent. of the fatal dose of any of the local anesthetics. Artificial respiration and cardiac massage, combined with the intravenous injection of epinephrine, permit recovery in most cases from 125 to 150 per cent. or more of the fatal vein dose of all the local anesthetics. The previous administration of ouabain permits recovery from 150 per cent. of the fatal dose of procaine when artificial respiration is employed.—Proc. Soc. Exp. Biol. Med.; through Chem. Abstracts, 13 (1919), 2709.

Malaria.—*Prevalence Among Dutch School Children.*—A medical examination of the school children in Zaandam, Holland, showed that of 1,100 children, 7 per cent. were affected with malaria.—Chem. and Drug., 91 (1919), 817. (K. S. B.)

Medicaments in France.—*Demand for.*—Under the title "Therapeutics Judged by Figures," L. Grimbert, head of the Pharmacie Centrale of the Parisian hospitals, interestingly outlines the fluctuations in the demands for medicaments at that institution during the years 1907–1917. He finds that the classic medicines used almost as much in 1917 as in 1907 included rhubarb,

senna, sodium sulphate, magnesium sulphate, sodium bicarbonate, calcined magnesia, bismuth subnitrate, sodium salicylate, silver nitrate, kermes mineral and antimony oxide. There has been a drop in the demand for cantharides, sodium cacodylate, quinine sulphate, caffeine, naphthol, benzonaphthol, all antiseptics, except formaldehyde, iodides, bromides, trional, sulphonal, cod liver oil, cinchona extract and wine and lactic ferments.

There has been increased demand for novarsenolbenzol, aspirin, urotropin, theobromine, codeine, veronal, collargol, protargol, sodium benzoate, ether for anesthesia, tincture of iodine, tricalcic phosphate and iodotannic syrup.

During the eleven years, there have been curious fluctuations in the demand for calomel, methyl salicylate, calcium glycerophosphate, dermatol and opium preparations.—J. pharm. chim., 19 (1919), 377.

Mouth Washes.—*Pneumococcal Solutions of.*—S. S. Cohen and Edward Steinfield report upon an investigation carried out at Dr. Cohen's request by Kolmer and Steinfield, the object being to find a solution that would keep mouth and throat secretions sterile. Specific pneumococcal substances were tried. Ethylhydrocupreine hydrochloride was effective in 1 : 160000 solution; quinine and urea hydrochloride and quinine bisulphate in 1 : 20000 and 1 : 10000, the strongest solution patients would use did not produce continuous sterility. Greater concentration demanded greater palatability. E. Fullerton Cook prepared for them solutions of quinine and urea hydrochloride up to 10 per cent., using honey, syrup, glycerin and acacia to give adhesiveness. Various flavors were tried and phenol was added to some. Fifteen formulas are given and tables showing the results of tests upon pure cultures of type I, II, III pneumococcus and upon sputum containing virulent pneumococci. Glycerin, honey and syrup did not interfere materially with germicidal action, but acacia did somewhat. A solution containing quinine and urea hydrochloride and phenol each 1 : 200, and with 20 per cent. of glycerin and a peppermint flavor is fairly palatable and is effective both for type III pneumococci and for sputum. It may be used with the N. F. compound solution of guaiac. Infusion of coca may be used instead of water in any of the formulas with increasing palatability, but some precipitation of quinine which may reduce germicidal activity only slightly since quinine tannate will inhibit growth of pneumo-

cocci in test tube cultures.—J. Am. Pharm. Assoc., 8 (1919), 405. (Z. M. C.)

Nasal Disinfection.—To rid the naso-pharynx and accessory sinuses of infective organisms, Woollacott recommends a form of treatment which aims at cleansing out all the passages from the inside by causing increased secretion. A solution of menthol, 1 drachm in 8 ounces of spirit with a few drops of eucalyptus oil is used, one to two drachms of which are added to a pint of very hot water in a jug. The patient holds his head, covered by a towel, over this mixture for some minutes, sniffing vigorously, thereby causing a free discharge from the nose. The procedure is repeated from three to six times daily. The author is of opinion that this treatment may also possess a prophylactic value.—Lancet; through Chem. and Drug., 91 (1919), 270.

Optical Isomerism.—*Viewed from the Biological Side.*—At a meeting of the North British Branch of the Pharmaceutical Society, Dr. Arthur R. Cushny discussed the subject of optical isomers, beginning with Pasteur's work on the tartaric acids and then describing his own experiments with hyoscyamine, which is levogyrate, atropine (*d* + *l* hyoscyamine) and synthetic dextrogyrate hyoscyamine. The latter acted more strongly on the spinal cord of the frog, but had only about one-fiftieth the power of true hyoscyamine on the peripheral nerve ends. Similar differences were observed with the isomeric hyoscines.—Chem. and Drug., 91 (1919), 1378.

Optical Isomerism.—*Pharmacological Action of.*—D. I. Macht finds that levo-hyoscyamine and levo-hyoscyne stimulate the contractions of the ureter, whereas dextro-hyoscyamine and dextro-hyoscyne have an inhibitory action. The action of atropine is the sum of the action of its two optically active varieties. Inactive or racemic scopolamine shows an inhibitory action, which is ascribed to the preponderating effect of the dextro component. Levo-adrenaline is much more active in stimulating ureteral contractions and raising the tone of the ureters than the racemic variety. Levo-camphor produced a marked stimulation; dextro-camphor was inactive. The effect of the racemic form is represented by the arithmetical mean of the two components.—J. Pharmacol.; through Pharm. J., 103 (1919), 296.

Pharmaceutical Preparations.—*A Plea for Closer Study of.*—L. E. Sayre quotes from the *Épitome* of the United States Pharmacopœia and National Formulary published by the American Medical Association. "Both the Pharmacopœia and the National Formulary include many drugs and preparations which are irrational, superfluous or worthless." Doctors (some of them at least) blame the pharmacists, pharmacists blame the doctors. Closer co-operation is needed and Prof. Sayre believes that the Section on Practical Pharmacy and Dispensing could inaugurate such co-operative work with representative members of the medical profession.—*J. Am. Pharm. Assoc.*, 8 (1919), 409. (Z. M. C.)

Pharmacology and Therapeutics.—*Co-operation Between.*—A. W. Hewlett in the Chairman's Address read before the Section on Pharmacology and Therapeutics at the 68th Session of the American Medical Association, dwells upon the importance of a healthy co-operation between those who are engaged in the scientific study of drug action and those who use drugs for the purpose of curing or alleviating disease. This is especially needed because of the fact that experimental work is usually done on animals and toxic doses may be administered while, in the clinic, therapeutic doses alone are used and may often be modified by disease. The author states that one of the most important methods for helping to bridge over the gap between animal pharmacology and therapeutics is the accurate study of the effects produced when drugs are given in the usual medicinal doses to human beings.—*J. Am. Pharm. Assoc.*, 8 (1919), 92. (H. H. S.)

Ptomainé Poisoning.—*Nature of.*—Asserting that "ptomainé is a term for chemical substances of uncertain origin, unknown nature and doubtful existence," the *Journal of the American Medical Association* says that there exists a similar confusion or lack of knowledge concerning what is commonly designated "ptomainé poisoning." Our conception of ptomaines has changed markedly since the time of Schmis, when these substances were regarded as animal alkaloids. The chemical research for split protein products as the cause of "ptomainé" poisoning has practically been abandoned. Most of these split products are amines, which are either not poisonous at all or no more so than their corresponding ammonia salts. The chemical resemblance between muscarine and cholin has directed the work toward the phosphatids, but thus far this line of research has not helped solve the puzzle of "ptomainé".

poisoning. Chemists avoid the use of the word ptomaines for the reason that it lacks precision. This is a curious instance of the popular use of a technical term that sounds well but means little. Only clinicians cling to it as a convenient refuge.—*Am. Drug.*, 67 (1919), 260.

Seasickness.—*Prevention of.*—It is now claimed that seasickness is caused by disturbances of the organs of equilibrium, which are situated in the semi-circular canal of the internal ear, and Major Lemon, United States Medical Corps, claims that it can be prevented by packing the ears with gauze.—*Chem. and Drug.*, 91 (1919), 699. (K. S. B.)

Styptics.—Ordinary bleeding has a strong tendency to stop spontaneously with the formation of a clot, so that the benefit attributed to a drug that has been used as a hemostatic cannot easily be evaluated. Evidence of the current confusion of cause and effect in relation to local hemostatics has been furnished by P. J. Hanzlik. In general, he finds that the local application of vasoconstrictor and astringent agents diminishes or arrests local hemorrhage, while vasodilator and irritating agents (without astringent action) increase local bleeding. The value of the newer thromboplastic agents of the kephalin or tissue extract type is considered as still uncertain. Epinephrine remains as the most efficient and desirable hemostatic agent. Tyramin and pituitary extracts were found efficient, and, unlike epinephrin, they do not increase bleeding later. Astringents were found variably effective, ferric chloride and tannin standing highest, while alum was disappointing. The vaunted cotarnin salts (stypticin and styptol), antipyrine and emetine, were found to increase bleeding on local application.—*J. Am. Med. Assoc.*, 72 (1919), 577. (W. A. P.)

Typhoid Fever.—*Chemical Diagnosis of.*—De Silvestri overlays 2 mils of ferric chloride solution and 4 drops of concentrated sulphuric acid with 3 mils of a filtered sample of urine. A maroon-colored ring occurs at the point of contact and a turbid ring exhibiting greenish fluorescence forms at the top of the upper layer, when the urine is that of a person suffering from typhoid fever.—*Riform. med.*; through *Drug. Circ.*, 63 (1919), 330.

War Wounds.—*Inefficiency of Sodium Fluoride and of Cadmium Sulphate.*—P. Philardeau reports that these two substances did not prove satisfactory as wound dressings; Dakin's solution being far more effective.—J. pharm. chim., 19 (1919), 126.

Young's Rule.—*An Application of.*—Dr. R. E. Cloud in a letter to the *Journal of the American Medical Association* suggests a modified Young's Rule for the dosage of medicines for infants as follows:

"Take the age of the infant in months and add 144 instead of 12, proceeding as with the old rule. For example, the dosage at five months is thus obtained:"

$5 + 144 = 149 \div 5 = 30$ approximately, or $1/30$ of the adult dose.

For a baby of 16 months:

$16 + 144 = 160 \div 16 = 10$, or $1/10$ of adult dose.

This operates exactly as Young's Rule and is, of course, subject to the same limitations. The possibilities for much more extensive application, however, are obvious.—Pract. Drug., Dec. 1919, p. 21. (H. H. S.)

DRUG STANDARDIZATION.

Alkaloids.—*Biochemical Assay of.*—II. Fühner employs the reaction between leech preparations and a mixture of the alkaloid with acetyl choline. In the case of physostigmine, $1/100000$ th of a milligramme of this alkaloid was detected; and by the same method $1/100$ th of a milligramme of nicotine was detected.—Biochem. Z.; through Chem. Abstracts, 13 (1919), 2228.

Crude Drugs.—*Partial Analyses of 330 American.*—This report by J. F. Clevenger and C. O. Ewing furnishes much valuable information, and information arranged in a very satisfactory way. The tabulation includes the following data for each drug: scientific and trade names, part employed, color of powder, total ash and acid insoluble ash, color and odor and total amount of ether extract, amount of volatile ether extract, and cleanliness. The authors explain methods used, give authorities used for determination of botanical identity and discuss some of the results.—J. Am. Pharm. Assoc., 8 (1919), 1010. (Z. M. C.)

Crude Drugs.—*Ash Standards for.*—Ewing and Viehoever discuss this subject in the light of their experience at the Bureau of Chemistry. They point out that the acid-insoluble ash is of even greater value in determining the quality of a drug than is total ash. They discuss the difficulty of setting ash standards for asafetida; they think the standard for hydrastis should be 8 per cent. total and 2.5 per cent. acid-insoluble ash; that for hyoseyamus should be 24 per cent total and 12 per cent. acid-insoluble ash; that for mustard should be 5 per cent. total and 1.5 per cent. acid-insoluble ash; and that for rhubarb should be 10 per cent. total and 5 per cent. acid-insoluble ash.

They further recommend the following procedure for the acid-insoluble ash determinations: To the ash obtained by the pharmacopœial method add 25 mls of 10 per cent. hydrochloric acid. Digest on a steam bath for 10 minutes, filter, wash, ignite over Bunsen burner, cool and weigh.—J. Am. Pharm. Assoc., 8 (1919), 725.

Frogs.—*Maintaining for Test Purposes.*—L. W. Rowe describes an apparatus which can be arranged in a sealed chamber whereby he is able to maintain a temperature varying only 1° C. from 15° C. throughout the entire year. This makes it possible to meet the U. S. P. specifications that frogs be kept at 15° C. until wanted for use.—J. Am. Pharm. Assoc., 8 (1919), 930.

(Z. M. C.)

Pharmacodynamic Assay Method.—*Preliminary Note on a New.*—P. S. Pittenger reports a continuation of his experiments on *Carassus auratus* (gold fish) as test animals for the digitalis series. Numerous tables are given showing the results of the present series of experiments and classified under the following heads: temperature, end-point, tentative standard, apparatus necessary for experiment. From these and previous experiments Mr. Pittenger concludes:

“1. Variations of less than 2 per cent. in the strength of tincture of digitalis can be accurately determined by the method outlined.

2. Variations due to difference in the rate of absorption appear to be practically eliminated by the use of these animals.

3. The weight of the fish may be disregarded when making tests by this method.

4. Variations in temperature markedly influence the resistance of gold fish to digitalis poisoning.

5. The individual variations in susceptibility of gold fish is much less than that in guinea pigs and frogs.

6. The gold fish method is unquestionably the simplest so far proposed and can easily be carried out by those not especially skilled in the pharmacodynamic art.

7. The inexpensiveness of the assay is decidedly in its favor. Gold fish of the proper size can be purchased wholesale for from 45 to 60 cents per dozen.

8. A sufficient number of animals can be procured at all seasons of the year.

9. Alcohol to the extent of that contained in the U. S. P. tincture does not affect the results.

10. A tincture of digitalis to be of standard strength should have a M. L. D. of 2.85 when assayed by this method."—J. Am. Pharm. Assoc., 8 (1919), 893. (Z. M. C.)

Pharmacological Assaying.—H. C. Hamilton tells us that discovery and development of medicinal substances has been largely dependent on pharmacology. Drugs which cause no typical reaction when given to animals or when applied to living tissue cannot be tested pharmacologically. In general it is believed that drugs which cannot be assayed chemically may possibly admit of assay pharmacologically. The objection to biological standardization is that it is qualitative, not quantitative. Mr. Hamilton takes up cannabis sativa, ergot, the heart tonics of the digitalis group, and suprarenal and pituitary gland extracts. Each is considered historically and the method of carrying out the tests carefully described. Much valuable information is given, together with an extensive bibliography, all of which should be of great help to any student of the assays.—J. Am. Pharm. Assoc., 8 (1919), 49. (Z. M. C.)

DRUG HISTORY.

Botany.—*As Applied to the Utilization of Medicinal Plants.*—James Small is the author of a comprehensive article, in which he aims to demonstrate the value of botany to the pharmacist and to interest the student in the many interesting problems of a botanical nature.

The papers include an interesting summary of the early materia medicas, their common drugs, uses and methods of preparation

of the same. The results of general and botanical exploration are carefully noted. The steps necessary for the introduction of a medicinal plant into medical practice, are exemplified by the complete account of the history of cinchona. Another installment includes the present application of botany to medicinal plants. Among the various explorers mentioned are: Hartmann, Fracklin, Ainslie, Falconer, Harris and Vaughan. The botanic gardens from the time of Theophrastus to the present day are described in minute detail.

The concluding interesting paragraphs are captioned as follows: Microscopy, Phytochemistry, Ecology, Genetics, Future Applications, Suggested Organization, Suggested Researches.—Pharm. J., 103 (1919), 199, 213, 248 and 294. (F. H.)

Mandrake and Other Famous Herbs.—Fred. B. Kilmer gives a great many historical facts regarding Mandrake, Henbane and several other drugs.—Pract. Drug., Oct. (1919), 24. (H. H. S.)

The Medicine Man's Practice.—C. A. Eastman, writing upon this subject emphasizes the fact that the most important principle in the practice of the Indian medicine man was superstition and the spiritual aspects of health and disease. The superstitious beliefs are not surprising when one realizes that they had but little knowledge of anatomy, physiology and pathology. Strong medicines were seldom employed and preference was given to botanicals administered in infusion form. Indians are strongly opposed to surgical procedures. Five modes of treatment are in vogue: steam bath, venesection, stomach bath, laxatives and rest cure.—Pharm. Era, 52 (1919), 281. (C. W. B.)

DRUG CURING.

Vegetable Drugs.—*Deterioration in Twenty-five Years.*—E. N. Gathercoal reports results of the examination of a collection of crude drugs prepared twenty-five years ago. They are tabulated to show whether they comply with present official standards or not. Many drugs were in excellent condition and fully met present requirements. The report represents a vast amount of labor and furnishes valuable data on the keeping qualities of many drugs.—J. Am. Pharm. Assoc., 8 (1919), 711. (Z. M. C.)

PERFUMERY MATERIAL.

Odor and Chemical Constitution.—*Relationship between.*—From a systematic survey of various classes of chemical compounds, containing only carbon, hydrogen, and oxygen, or only two of these elements, and from a knowledge of their odor or lack of it, while recognizing that other factors may play a part the author concludes that the presence of unsatisfied partial valencies or residual affinities is the prime cause of a chemical substance having an odor.—*Perf. Ess. Oil Rec.*; through *J. Soc. Chem. Ind.*, 38 (1919), 479A.

Odorous Principles of Plants.—*Distribution and Character of.*—Frederick B. Power, in a rather extensive review of this subject, calls attention to the chemical and physical properties of the complex constituents in a large number of odorous plant principles. It is suggested that the original article be consulted, owing to the difficulty of adequately abstracting this article.—*J. Ind. and Eng. Chem.*, 11 (1919), 344. (L. A. B.)

Pomades.—*Manufacture.*—A deflorating machine has been devised and patented by Lautier Fils at their factory in Grasse, a French center for the manufacture of perfumes. Through this invention much of the hitherto unavoidable hand labor necessary in the manufacture of flower pomades has been eliminated. The invention consists of an apparatus which can be so adjusted as to remove all but the very small blossoms from the screen frame as it is passed through the machine, without in any way coming into contact with the grease. The remaining tiny sprays of flowers are, in turn, removed by another apparatus which works by means of a special suction device.—*Am. Drug.*, 67 (1919), 223.

MISCELLANEOUS.

Aphis.—*Destruction of.*—The leaves of plantain, *Plantago media*, are said to be an instantaneous cure for aphis or blight in fruit trees, if rubbed upon the affected part. In New Zealand seaweed is wound around the stems of trees on which aphides are suspected.—*Chem. and Drug.*, 91 (1919), 885. (K. S. B.)

Dope.—*Suggested Term for Narcotic Drugs.*—H. C. Meyrick suggests that the term "dope" be used to indicate narcotic drugs,

instead of saying simply "drug," as the latter term properly includes the ordinary harmless drugs which are dispensed alone or in combination.—Chem. and Drug., 91 (1919), 112. (K. S. B.)

Drug Research.—*Indian.*—A committee has been appointed to prepare a scheme for the establishment of a pharmacological laboratory and research institute for scientific experiment with, and research into, drugs indigenous to India, following a motion to this effect by Khan Bahadur Ebrahim Haroon Jaffer at a meeting of the Bombay Legislative Council.—Chem. and Drug., 91 (1919), 5. (K. S. B.)

Drugs.—*Ash Content of Powdered.*—O. Anselmino gives comparative data as to ash content of powdered rhubarb, iris, calamus, pinchona and pomegranate in various degrees of fineness.—Ber. pharm. Ges.; through Chem. Abstracts, 13 (1919), 2413.

Drugs.—*Powdering.*—An addition of milk sugar greatly facilitates the powdering of many drugs in the milling process. Thus ergot could be reduced to a fine powder in a short time. When the powder is to be used for analytical purposes milk sugar may be replaced by sand or emery, according to B. A. van Ketel.—Pharm. Weekblad, 56 (1919), 785. (H. E.)

Fertilization.—*Explosive.*—Observing the vigorous growth of wild plants on the edges of shell craters, and attributing this growth to the breaking up and impregnating of the soil with the nitrous explosive products, André Piedallu has designed a cartridge filled with explosives innocuous to plant life and containing a tube of appropriate fertilizers (phosphates, nitrates, potassium, etc.), which he proposes to bury and explode, planting fruit trees in the holes thus made.—Chem. and Drug., 91 (1919), 162. (K. S. B.)

Fruits.—*Preservation of.*—In experiments conducted by G. Bertrand, dealing with the preservation of fruits in the cold, without the use of sugar, alcohol or preservative, cherries, red and white currants, raspberries, plums or apricots, either whole or sliced, were used. The fruit was well washed with distilled water, and then placed in containers filled with either distilled water or boiled tap water. The containers were sealed with rubber stoppers in such manner as to insure the exclusion of air. The exhibits were

kept during summer, autumn, winter and spring. A marked alcoholic fermentation became manifest in some of the containers in the early stages of the experiment, while in other cases the fermentation only took place at a later time. After a lapse of 11 months, there was no indication of fermentation in 17 out of the original 42 containers, and in 4 only slight changes could be noted. In no case was butyric fermentation or putrefaction noted. Distilled water was found superior to boiled tap water.—*Compt. rend.*, 168 (1919), 1162 and 1285. (G. C. D.)

Gases.—*Absorption by Soils.*—To determine the protective value of soil against asphyxiating gases, Berthelot and Trannoy conducted experiments which showed that white sand absorbs little chlorine, yellow sand is little better, and wet vegetable soil absorbs chlorine freely.—*Chem. and Drug.*, 91 (1919), 162.

(K. S. B.)

Indo-China.—*Research Institute in.*—A scientific institute has been founded in Indo-China and endowed with a million francs. The possibility of introducing cinchona cultivation into this French colony is to be investigated.—*Chem. and Drug.*, 91 (1919), 858.

(K. S. B.)

Indo-Chinese Condiments.—Brémond and Rose describe the fish condiments of Indo-China.

Nuoc-mam, which means "salty fish water," is made by macerating certain fish (notably of the Clupeidæ) in a concentrated solution of sea salt and is essentially a saline solution of proteins in a certain degree of disintegration. It consists largely of a solution of pancreatic peptone. It contains 15 to 25 grammes of total nitrogen and 10 to 20 grammes of organic nitrogen per liter and should contain at least 200 grammes of sodium chloride per liter. When of the foregoing requirements, *nuoc-mam* will keep for at least a year.

Prahoc of Cambodia and *padec* of Laos are fish pastes containing products of the fish from which they are made. These pastes are only partially soluble in water and the aqueous extract resembles *nuoc-mam*.

Mam-tom is a similar paste prepared from shrimp. All three of these fish pastes contain from 52 to 65 per cent. of water, 26 to 30 per cent. of soluble matter, 8 to 17 per cent. of insoluble matter,

and have a total nitrogen content of from 22.8 to 37.8 parts per 1000.—Am. Inst. Pasteur; through J. pharm. chim., 20 (1919), 34 and 36.

Laboratory.—*The Diagnostic.*—Jacob Diner sums up admirably the scope of such work which a pharmacist may undertake and gives a list of tests with the usual prices. The necessary equipment is classified into four groups: glassware, reagents, implements and accessories. Thorough training is obviously an absolute necessity. Direct advertising begins by announcing to physicians that a laboratory has been established and by inviting them to inspect it. Proper containers for collection of specimens should be provided. Scientific literature should be mailed regularly to physicians. Indirectly, the kind of work done, the maintenance of a first-class laboratory, expression of willingness to allow a physician to see the work while it is being done, all advertise the laboratory. Finally Dr. Diner gives a number of references for collateral reading. To the pharmacist about to enter this field of work, Dr. Diner's article should be most valuable.—J. Am. Pharm. Assoc., 8 (1919), 747. (Z. M. C.)

Laboratory.—*The Pharmacognosy.*—Arno Viehoveer discusses this subject under two headings: "Crude Drug Control" and "Pharmacognosy Investigations." Under the first he calls attention to the work already done, some of which has been reported. A preliminary survey of the crude drug industry of the southern Appalachian region has been made; attention has been directed to some adulterants found in imported drugs; information has been obtained about methods for separating inert and objectionable material from crude drugs; standardization of drugs has been extended; it has been found that volume weight determination can be more widely used; collection of data for improvement of the U. S. Pharmacopœia has been continued; ways are suggested for prevention of waste and utilization of waste in connection with cinchona, ipecac, areca nuts and American ergot.

The "Pharmacognosy Investigations" cover studies of brassicas; oxalic acid in foods and spices; Spanish digitalis and *Digitalis thapsi*; saponins; *Piper bredemeyeri*, an adulterant of matico; cedron seed, *Simaba cedron*, and the glucoside cedrin; microsublimation; vegetable products, tepary beans, coffee and peat; isolation of some constituents of the cotton plant, *Gossypium herbaceum* and other

gossypium species. Cyanogenesis has received considerable attention, the studies being on edible and poisonous varieties of beans of the Lima type; the fate and significance of linamarin in the metabolism of the bean plant, flax, etc., distribution and occurrence of cyanogenetic glucosides; isolation of hydrocyanic acid and the glucoside yielding it from Indian beans of Lima type, *Phaseolus lunatus*, from flax, *Linum usitatissimum*, etc.—J. Am. Pharm. Assoc., 8 (1919), 717. (Z. M. C.)

Locusts.—*Destruction of.*—Vayssiere found liquid flame excellent as a locust destroyer in Morocco and Southern France, when there is no danger of setting fire to crops, etc. Asphyxiating gases were less effective. An aqueous emulsion (25 or 50 per cent.) of chloropicrin is also recommended, while a 4 per cent. mixture of arsenic in bran killed 80 per cent. of the locusts in 24 hours.—Chem. and Drug., 91 (1919), 1081. (K. S. B.)

Plants.—*Use as Insecticides.*—R. C. Roark in searching through the literature noticed many references to the insecticidal action of plants. The scarcity of the substances generally used for such purposes made it seem worth while to bring to the attention of entomologists and others the many different plants that might be used for this purpose. He gives quite a long list of plants, but makes it plain that he assumes no responsibility as to the efficacy of statements made by the authors he quotes. This paper is of value as opening the way for further study to those who might be interested commercially.—Am. J. Pharm., 91 (1919), 25 and 91 (J. K. T.)

Vision.—*Theory of.*—Stating that something electrical and chemical is necessary for vision, Oliver Lodge suggests that in the retina of the eye—perhaps in the black pigment—there are certain atoms which are stimulated into radio-activity by impact with waves of light of luminous frequency, and that those atoms, when they receive the waves, accumulate energy of the right frequency and stimulate the nerve. He suggests placing the retina of a dead eye on an electroscope, then illuminating with red, green, or violet light, to see whether it would shoot off electrons and stimulate the electroscope.—Chem. and Drug., 91 (1919), 1067. (K. S. B.)

B—VEGETABLE DRUGS

Acacia.—*Adulteration of.*—M. Pfrenger reports on a sample of acacia cunningly adulterated with sodium carbonate so that the starch which was also present would not respond to the iodine reaction. He suggests that the new German Pharmacopœia include a test directing that acacia solution, after acidulation with hydrochloric acid and cooling, should give neither a blue or wine-red color to iodine solution. Such test would not only reveal the adulteration just cited but would also detect the presence of dextrin.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2966.

Acacia.—*Effects of Injecting.*—Meek and Gasser after considerable experimentation find that the injection of large amounts of 20 per cent. acacia have no effect on blood pressure beyond increasing the blood volume. After hemorrhage, acacia seems to maintain the blood pressure better than salt solutions. A pentose reaction is obtained in the urine an hour after the injection of acacia.—Am. J. Physiol.; through Chem. Abstracts, 13 (1919), 41.

Acacia.—*Purification of.*—Acacia can easily be purified by the following process according to Borntraeger: Ten kilos of the gum are placed into a muslin bag and are dissolved in 30 liters of water. To the solution 50 liters of alcohol are added and the mixture is made slightly acid with hydrochloric acid. The white precipitate is collected and dried at moderate heat. The gum, thus purified, gives with water an almost clear solution and possesses strong adhesive properties. The yield is 88 per cent.—Rep. pharm.; through Pharm. Weekblad, 53 (1919), 1399. (H. E.)

Acacia.—*Use in Shock.*—The study of "shock" due to accident pounds, and to surgical operations has long engaged the attention of physiologists, and various remedial methods have been suggested. Prof. Bayliss strongly recommends injections of solution of gum arabic, which is free from the dangers attaching to gelatin. The condition of shock is accompanied by a loss of fluid from the circulation, which must be made good, and salt solution sometimes used for this purpose is only partially effective, since it transudes through the walls of the capillaries. This defect is avoided by the addition of gum arabic to the saline solution, and as a result the article states that "many patients were saved who, without the

injection, would certainly have died of the original injury or of the subsequent operation."—Brit. Med. J.; through Pharm. J., 102 (1919), 110.

Aethusa Cynapium.—*An Adulterant of Conium.*—C. O. Ewing, E. E. Stanford and J. F. Clevenger report the result of a careful examination of these two plants. They have tabulated the differential characteristics in a way that will simplify comparison. The statement that conium leaves when rubbed evolve a "mousey" odor, they believe, is not reliable because *aethusa* under some conditions might give it also. Alkaloidal assay gave some information worth recording, but not of a sort that would aid in the identification of the two plants. They conclude that conium herb might well be deleted from our materia medica because of its great variability and rapid deterioration. If it is to be used at all, probably the flowering or fruiting plant should be specified. They found nothing in the literature or in their analytical results to indicate that *aethusa* was of practical therapeutic value.—J. Am. Pharm. Assoc., 8 (1919), 385. (Z. M. C.)

Agar-Agar.—*Japanese Exports.*—The Japanese exports of agar-agar for the year ending December 31, were as follows: 1916, 2,785,710 kin; 1917, 2,106,942 kin; 1918, 2,639,456 kin. The destinations were as follows:

	(1916-kin)	(1917-kin)	(1918-kin)
China.....	478,669	693,387	184,723
Hong-kong.....	344,959	275,799	119,742
Straits Settlements.....	122,564	114,675	74,181
Dutch Indies.....	392,454	239,143	266,270
Asiatic Russia.....	152,396	877	803
Great Britain.....	325,461	226,244	1,595,260
France.....	327,296	93,259	33,570
United States.....	421,824	257,454	155,586
Other countries.....	220,087	206,104	209,321

—Chem. and Drug., 91 (1919), 363. (K. S. B.)

Agar-Agar.—*Making into Flakes.*—Soak and rinse a suitable quantity of agar-agar in water, drain well, grind through a meat-mincer, and spread out in thin layers on cheese-cloth trays and dry in a dust-free airy place. When dry collect and store in suitable vessels. This product is usually prescribed in doses of one to four heaped teaspoonfuls (1 to 4 grammes). If it is desired to medi-

cate the agar-agar, the required amount of medicament for each 500 grammes is dissolved in water so as to form 1,000 mils of solution. This solution is mixed with the flake agar-agar, and as soon as it is evenly and completely absorbed the product is again spread out to dry.—Pharm. J., 103 (1919), 251.

Agave America.—*Constituents.*—J. Zellner, using the air dried leaves found the following constituents: The *petroleum ether extract* (1.03 per cent.) consisted of fat, chlorophyll and wax; the *ether extract* (0.74 per cent.) consisted of wax; the *aqueous extract* (50.75 per cent.) contained 12 per cent. of amorphous carbohydrates, 12.68 per cent. of sugar, calculated as dextrose, 8 per cent. of malic acid, 7.54 per cent. of ashes and 10 per cent. of other matter, such as amino acids, peptones, etc.

The non-soluble matter consisted of 17.85 per cent. of cellulose, 7.44 per cent. of pentosans, 1.01 per cent. of methyl pentosans, pectin and hemicelluloses, 13 per cent. of oxalates, 4.82 per cent. of mineral material and 3.25 per cent. of proteins.—Z. physiol. Chem.; through J. Chem. Soc. Abs., 116, I (1919), 190.

Aloes.—*Collection of Curacao.*—Vierhout and Dussel report that Curacao aloes is collected chiefly on the island of Aruba, although large areas on Curacao and Bonaire are also cultivated. The cultivation is easy and inexpensive. The plant requires a dry, chalky soil, and is propagated by cuttings taken from old plants. These are set about 0.5 m. apart in rows that are rather more than that from one another. The plant produces a short stem and a rosette of leaves. After the rains it sends up a flowering stem about 0.75 decimeter long, which divides into two or more branches. It yields a normal amount of aloes for about twelve years; after that it must be dug up and the ground manured and replanted. In the dry season the leaves are cut off and placed in narrow V-shaped troughs, made up of two planks several meters long, and set on a slant so that the exuded juice drains into empty petroleum cans. The contents of these are transferred to wooden vessels holding about eight gallons, which are conveyed to the boilers. These are large, open copper pots under a rough shelter. In them the aloe juice is boiled down to a suitable consistence, which takes about twelve hours. The concentrated juice is then run into empty petroleum boxes lined with paper or into gourds in which it solidifies.—Pharm Weekblad; through Pharm. J., 103 (1919), 537.

Aloes.—*South African Union Exports.*—The Union of South Africa exported aloes during 1917 and 1918 as follows:

To	(1917-lb.)	(1918-lb.)
United Kingdom.....	547,821	155,986
Hong Kong.....	.....	29,312
Japan.....	91,454	9,540
United States.....	113,360	254,839

—Chem. and Drug., 91 (1919), 523. (K. S. B.)

Aloes.—*Use for Bites and Stings.*—Pugnat states that he has obtained excellent results in the treatment of bites and stings of mosquitoes and wasps by rubbing the affected part with cotton-wool dipped in a saturated alcoholic solution of aloes. One condition which is absolute is that this should be done immediately after being bitten.—Med. Presse; through Chem. and Drug., 91 (1919), 1121.

Aloes.—*Use for Healing Wounds.*—X-Rayser II states that aloes has always been regarded as a vulnerary though this was not its chief use. Lemery says that applied externally it resists corruption. Friar's balsam, it is true, contains but a small proportion; the tincture of myrrh and aloes of the Edinburgh Pharmacopœia, of which Brookes says: "This is very good used externally for Wounds, Ulcers, etc.," was a more important preparation in this respect, as we learn from Quincy, who says of aloes: "It is of great account among Surgeons, in the Tincture of Myrrh, for external intentions." The Edinburgh book had also an Elixir Proprietatis, which, in addition to aloes and myrrh, contained oil of tartar and saffron. This was adopted by the London College under the name of Tinct. Aloes Co. (the oil of tartar being omitted), and there was a time in which it was in considerable demand as a vulnerary in veterinary practice. In Professor Henslow's *Medical Works of the Fourteenth Century* there is a recipe for an ointment of aloes and opium, "for a man that hath lost his sight altogether," which is declared to be efficacious.—Chem. and Drug.: through Pract. Drug., Jan., 1919, 38.

Althæa.—*Constituents of.*—O. von Friedrichs reports that marshmallow root contains about 1.7 per cent. of fat, which consists of the glycerin esters of palmitic and oleic acid, further butyric

acid and phytosterol which seems to be identical with sitosterol. The odorous principle which is volatile with steam and is soluble in ether but not in petroleum ether, could not be isolated and identified. The root contains a lecithin, which consists of palmitic and oleic acids and probably choline as the base. Ten per cent. of saccharose and about 1 per cent. of invert sugar were found in the root. The mucilaginous matter in the root is not galactose, as given in many text-books, but a polysaccharide of the formula ($C_6H_{10}O_5$), which consists of 64 per cent. of glycosan and some xylan. However, the root contains a saccharo-colloid which, on hydrolysis, yields galactose.—Arch. Pharm.; through Pharm. Weekblad, 56 (1919), 1571. (H. E.)

Ambrette Shrubs.—*Cultivation in West Indies.*—P. H. Moalcot describes the sowing, reaping and marketing of the seeds of *Hibiscus abelmoschus*.

The peculiarities of the climate and the tendency of the seed to germinate rapidly make it necessary to resort to the forking system for working and tilling the soil. The seeds are expelled by the aid of the sun's heat. After being expelled from the pods they are used by the natives as an anti-spasmodic stimulant and diuretic. Bonastre analyzed the seed and found it to contain, water and parenchyma, 50.00; gum, 36.00; albumin, 5.60; fixed oils, resins, crystals and 6.4 per cent. of odorous principals. The crushed seeds emit an odor of musk.—Am. Drug., 67 (1919), 301. (F. H.)

Ampelopsis Quinquefolia.—*Constituents of Fruit of.*—Geo. D. Beal and Edward A. Glenz report finding in the fruit, the following constituents: Sucrose, dextrose and levulose; oxalic, malic, tartaric, citric and tannic acids; wax and about 25.6 per cent. of a semi-drying oil of the castor oil type.

A table of analytical constants of the oil is given. The air-dried fruit gave 28.91 per cent. benzene extract, 21.1 per cent. methyl alcohol extract, 1.8 per cent. cold water extract, and 14.7 per cent. diluted sulphuric acid extract.—J. Ind. and Eng. Chem. 11 (1919), 959. (L. A. B.)

Annatto.—*Javanese.*—Orlean, largely used for coloring butter and cheese, is obtained from annatto, the name under which the seeds of *Bixa Orrellana* are known, a tree indigenous to Brazil, but met with in all tropical countries. In 1828 Rumphius advocated

planting this useful tree along the roads in Java on account of valuable coloring material, and it is extensively used to enclose coffee plantations, as it has been found effective in preventing coffee leaf disease. It offers no prospects as an object of cultivation, but the increasing prices for this coloring matter have not been without influence in enhancing its market value. It was first mentioned in the Batavia market reports in 1911, when the price was seven to eight florins a picul; in July, 1912, the price had risen to 14 florins a picul.—Pharm. Era, 52 (1919), 326.

Argemone Mexicana.—*Alkaloid in.*—At the Indian Scientific Congress, D. N. Chatterji discussed *Argemone mexicana*, or prickly poppy, which is widely distributed in India. Opinions differ as to whether the seeds are poisonous; they may contain morphine, Dragendorff having obtained from them an alkaloid responding to morphine tests. The juice is not regarded as narcotic. The author obtained only a trace of alkaloid from the seeds, in the form of yellowish white crystals, bitter and alkaline. It differed from morphine in reactions, a characteristic test being the appearance of a violet color followed by grey with a bluish green tinge, and a sepia color on heating, when a trace of nitric acid was added to a sulphuric acid solution of the alkaloid.—J. Soc. Chem. Ind., 38 (1919), 99R.

Arum Italicum.—*As Source of Starch.*—E. Pantanelli discusses *Arum maculatum* and *A. italicum*, both of which are known as "Gigaro" in Tuscany. Only the latter is worthy of commercial attention, since the roots of *A. maculatum* are too small. Roots of two-year old plants contain during the resting period 20 per cent. of starch, and those from three-year-old plants 21 per cent. Fresh roots gathered during the dormant season gave to laboratory experiments 20 to 23 per cent. of glucose, or 10 per cent. of alcohol. The roots may be worked with the same plant as is used for the manufacture of potato starch or glucose, or for distilling alcohol from potatoes. *A. italicum* can be cultivated with success, but at present the wild plant is so plentiful in Italy that this is not necessary. The tubers, besides being rich in carbohydrates, contain 0.28 per cent. of total nitrogen. They afford a useful fodder for farm stock.—Stat. agrar. ital.; through Pharm. J., 103 (1919), 217.

Asafetida.—*Adulterated.*—E. Claassen subjected a piece of asafetida weighing 9.310 grammes to extraction with hot water, followed with alcohol and obtained a residue composed of particles of rock, partly white and shining, and partly grayish with black spots. The first proved to be calcite and the others granite, the black spots in this being amphibole; their weight was 4.241 grammes; the calcite amounting to 3.306 grammes. The whole adulteration amounted to 54.45 per cent. Another piece of asafetida was found to be adulterated with calcite only and in the same amount.—*Am. J. Pharm.*, 91 (1919), 164. (J. K. T.)

Atractylis Gummifer.—*Constituents of Root of.*—This Moroccan plant, called El Heddah by the Arabs, possesses a root that is remarkable because of the fact that while it is very poisonous in the fresh state, in the dried condition is devoid of toxicity. H. Winschendorff has analyzed the dried root and finds that the petroleum ether extract (3.95 per cent.) is a rubber-like mass that can be easily vulcanized; that the ether extract (0.48 per cent.) yields a crystalline body and two resins; that the chloroform extract (0.36 per cent.) contains a bitter principle; that the alcohol extract (11.75 per cent.) contains tannin and a reducing sugar; and that the boiling water extract (22.5 per cent.) contains mucilaginous matter and crystalline needles of apparently potassium atractylate. The root yields 6.8 per cent. of albuminoid material and 14.88 per cent. of ash, which is remarkable for its high content of silica (29.6 per cent.) and of ferric oxide (12.4 per cent.).—*J. pharm. chim.*, 20 (1919), 318.

Balsams.—*Alcohololysis of.*—Fourneau and Crespo suggest the following procedure:

The balsam is boiled for six hours with an equal weight of alcohol containing 3 per cent. of hydrogen chloride. The product is then neutralized with sodium carbonate and the esters and alcohols are distilled off in steam and subsequently separated by fractional distillation. In this process the resins are not attacked. Tolu and Peru balsams, benzoin, and storax were examined, and the results show that the balsams consist of mixtures of cinnamyl and benzyl cinnamates and benzoates in varying proportions and resins. From Peru balsam a small quantity of a terpenic alcohol, probably identical with Thoms' peruvicol, was found. Storax only yielded cinnamyl cinnamate, there being no indica-

tion of the presence of either benzyl alcohol or benzoic acid. The application of alcoholysis in the analysis of balsams is suggested.—Bull. Soc. Chim.; through J. Soc. Chem. Ind., 38 (1919), 688A.

Balsams.—*Examination and Requirements of Some.*—L. van Italia having examined a great number of samples of copaiba, Peru balsam and tolu balsam, reports that the following tests should be applied:

Copaiba.—The specific gravity should be 0.960–0.966, the acid number 75–85, and the ester number not more than 14. The U. S. P. permits the use of balsams with a lower specific gravity which naturally have a lower acid number. The balsams should be soluble in an equal volume of absolute alcohol. (Absence of fats.) The balsam should at most give a faint turbidity when dissolved in two parts of petroleum ether. (Absence of gurjun balsam and rosin.) The amount of resin is determined by evaporation, during which process any admixture of turpentine can be detected by its odor. It is recommended that the residue be dried in an oven at 100–105°. The resin which should amount to at least 45 per cent. (the balsams with a lower specific gravity yield less resin) should be brittle (absence of paraffin, wax, etc.). The gelatinization tests for rosin with ammonia water is unreliable, but the test may be used for detecting fatty oils; thus a balsam containing 10 per cent. of castor oil, when shaken with three parts of ammonia water, gave a turbid mixture. The nitrite test for gurjun balsam should be made with the volatile oil and not with the balsam directly, because most balsams contain the sesquiterpene cadinene, which produces the red coloration. The test for African or Illurin balsam should be made polarimetrically as given in the U. S. P.

Tolu balsam.—When boiled with 20 times its weight of alcohol or chloroform not more than 3 per cent. of insoluble matter should remain undissolved. When one gramme of the balsam is boiled with 20 mls. of carbon disulphide, the solution on evaporation should yield a crystalline residue, which should have a pure aromatic odor (absence of turpentine or rosin) and which, when boiled with 2 to 3 mls of ammonia water, should yield a liquid which does not gelatinize even when allowed to stand for 12 hours. (Absence of rosin.) The balsam has an acid value 110–160 and a saponification value 160–210. The ash should not exceed 0.5 per cent.

Peru balsam.—Specific gravity 1.145–1.180. When heated on a water-bath no odor of turpentine, copaiba or storax should be noticeable and the loss should not exceed 2.5 per cent. Peru balsam gives a clear solution with 2 parts of alcohol, but the solution becomes turbid when more alcohol is added. One part of the balsam gives with a solution of 3 grammes of chloral hydrate in 2 mls of water a clear solution (absence of fatty oils). Three volumes of the balsam dissolved in one volume of carbon disulphide give a clear solution. (Absence of artificial balsam.) When five drops of the balsam are shaken with 8 mls of petroleum ether, the balsam should separate as a sticky mass, adhering to the bottom and sides of the container, but should not form a granular mass. The petroleum ether solution, when evaporated, should yield a residue which should not be colored green or blue by the addition of strong nitric acid (absence of artificial balsam). The acid number should be 56 to 80. The saponification number not less than 220. The balsam should yield not less than 55 and not more than 80 per cent. of cinnamein, which should have a saponification number of at least 235.—Pharm. Weekblad, 56 (1919), 1185. (H. E.)

Bay Rum.—*Production at Santa Cruz.*—References to the bay rum industry in the Virgin Islands of the United States, formerly known as the Danish West Indies, are made in a publication covering the activities of these possessions, which has been issued by the United States Bureau of the Census.

The report states that the distillation of bay rum was formerly one of the chief industries on St. Thomas Island, the bay rum being made largely for export purposes, but in 1917 only 3 per cent. of the value of products for the islands was reported by the bay rum industry, due to lack of bay oil. This oil, from which the rum is distilled, is a product of St. John Island. It amounted to very little in 1917, a hurricane that year having almost entirely destroyed the bay leaves from which the oil is made.

General statistic of manufactures show that in the bay rum industry last year there were four establishments, with an average of twelve wage earners; that the products were valued at \$38,745, and that the value added by manufacture was \$15,457.—Drug. Circ., 63 (1919), 190.

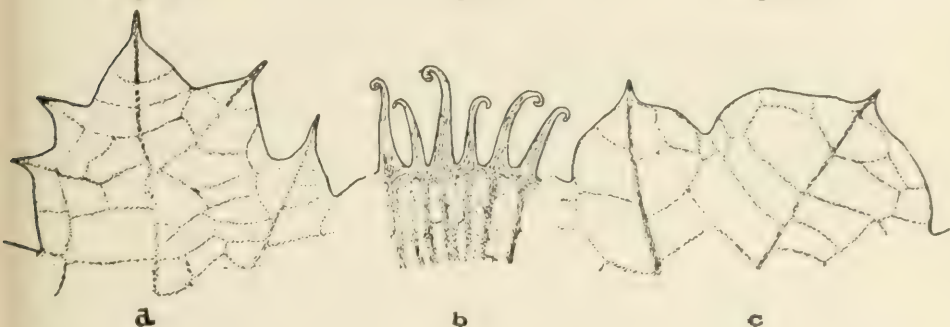
Ballota Hirsuta.—*Use as Adulterant of Horehound.*—C. O. Ewing and J. F. Clevenger report that during the last two years

this species has been offered as horehound. Both *Ballota hirsuta* and *Ballota acetabulosa* closely resemble horehound. The leaves can hardly be distinguished, except that under the microscope they show a difference in hairs. The shape and lobing of the calyces is the best means of differentiation. The calyx of true horehound is only about half as large as those of the other species and is tubular while the calyx in each of the other species is nearly funnel-shaped.

Fig. 13.

Fig. 14.

Fig. 15.



The margin of the calyx of *B. acetabulosa* (Fig. 15) has 10 to 20 obtuse lobes; *B. hirsuta* (Fig. 13) has 10 to 20 acute lobes; *Marrubium vulgare* (Fig. 14) has 10 awl-shaped recurved teeth. No chemical data regarding *B. hirsuta* is available, but it has an agreeable odor and imparts to candy a flavor closely resembling horehound. The report is illustrated by cuts of calyces and leaf hairs of the three species.—J. Am. Pharm. Assoc., 8 (1919), 273.

(Z. M. C.)

Beets.—*Use as Indicator.*—Chauvierre reports that the filtered aqueous extract of red beets, which is a violet-red opalescent liquid, turns deep yellow in the presence of alkalis and retains its color in the presence of either mineral or organic acids. It is sensitive to sulphuric acid containing one part of acid in 10,000 parts of water. Test paper cannot be prepared with the extract, because it does not dye paper.—Bull. Soc. Chim.; through Drug. Circ., 63 (1919), 381.

Belladonna.—*Cultivation of.*—G. P. Koch reports in detail various phases of belladonna culture. Following are some of the

subjects considered: the percentage of germination of seeds under various treatments; how to plant and when to transplant; the effect of fertilization; influence of moisture and shade upon growth; how to combat insects; how alkaloidal content is affected by temperature at which the leaves are dried and also by the presence of stems; the production of seeds. There is a wealth of information in the paper for those who are interested in growing belladonna.—*J. Am. Pharm. Assoc.*, 8 (1919), 390. (Z. M. C.)

Belladonna.—*Indian.*—E. M. Holmes states that the source of this plant is *Atropa Belladonna*. Transportation is the chief difficulty in the way of an increase in the exportation of the article from India and some trouble has been encountered in drying and properly packing in bales to withstand the effects of shipment.—*Pharm. J.*, 102 (1919), 2. (C. W. B.)

Belladonna.—*Indian Cultivation of.*—Arrangements are being made for extensive cultivation of belladonna at Mungpoo, India.—*Chem. and Drug.*, 91 (1919), 37. (K. S. B.)

Belladonna.—*Use in Influenza.*—Davy prescribes the following in cases of influenza:

Sod. salicyl.....	gr. vij.-x.
Spir. ammon. arom.....	℥x.
Spir. chloroformi.....	℥x.
Tinct. belladonnæ.....	℥v.-vij.

Every four hours.

The belladonna removes the frontal headache. If there is irritable cough, the author adds to the dose 5 minims of antimonial wine.—*Brit. Med. J.*; through *Chem. and Drug.*, 91 (1919), 270.

Benzoin.—*Constituents of Sumatran.*—Lieb and Zinke finds that Sumatra benzoin dissolves completely in hot diluted aqueous sodium hydroxide and from this solution, on cooling, deposits the sodium salt of benzoiresinol, melting at 339–341° and probably, $C_{29}H_{44}O_4$. The mother liquor, on addition of a little ether, deposits crystals of the sodium salt of sumaresinol, $C_{30}H_{48}O_{4.8}H_2O$, melting at 298–299°. It is isomeric with siaresinol.—*Monatsh.*; through *Chem. Abstracts*, 13 (1919), 382.

Blue Flag.—*Commercial.*—The attention of Oliver A. Farwell was attracted by the purplish brown color of much of the blue flag of the market, which differs from the description of the official drug. He was able to secure flowering plants which were the source of this blue flag and identified it as *Iris caroliniana*. He is of the opinion that the definition for *Iris Versicolor* should be changed to permit the use of *Iris caroliniana*.—Bull. Pharm., 33 (1919), 475. (C. M. S.)

Boswellia Serrata.—*New Source of Oil of Turpentine.*—R. S. Pearson and Puran Singh, of the Forest Research Institute, Dehra Dun, India, claim that a turpentine obtained from the stems of *Boswellia serrata* furnishes an oil equal to good quality American turpentine oil and a rosin quite suitable for the manufacture of varnishes. The rosin is equal in value to grade "G" American rosin.—Nat. Drug., 49 (1919), 383. (C. M. S.)

Broom Corn.—*Coloring Matter of.*—The glumes of black-seed broom corn are rich in coloring matter, which can be extracted by treating them with acidulated water in an autoclave, according to Piédallu. It imparts to wool, silk and leather a salmon-red color without the aid of mordants. Mordants, however, increase the intensity and fastness of the color and modify the shade, producing violet, red, yellowish brown and gray colorations.—J. pharm. chim.; through Drug. Circ., 63 (1919), 504.

Buchu.—*South African Exports.*—The South African exports of buchu during 1917 and 1918 were as follows:

To	(1917) Pounds	(1918) Pounds
United Kingdom.....	27,842	40,141
Australia.....	209	219
United States.....	96,059	49,315

—Chem. and Drug., 91 (1919), 524. (K. S. B.)

Cacao Shells.—*Toxicity of.*—Marchadier and Goujon state that during the war the cacao shells, the perisperm or thin friable membrane surrounding seed of *Theobroma cacao* was used largely as fodder for the horses of the French Army and that as a result a

number of horses died from the overdoses of theobromine thus ingested. The authors found in such crude shells 0.18 to 0.26 per cent. of caffeine and 0.66 to 0.70 per cent. of theobromine. If, on the other hand, the animals were fed with the shells after extraction of the alkaloids, the material was without food value; hence the authors believe that the sale of cacao shells as animal food should be prohibited.—*J. pharm. chim.*, 20 (1919), 209.

Calabar Beans.—*Assay of.*—George E. Æwe directs attention to the fact that the assay method of U. S. P. VIII gave too low results and states that he has found the method of U. S. P. IX unsatisfactory also. The low results of the earlier method were due to insufficient acid and ether used for the extraction and he believes the low results of the present method are due to incomplete extraction, to decomposition of the alkaloids because of the many manipulations and the heating prescribed, and to exposure to light. The following method devised by the laboratories of H. K. Mulford and Company has been satisfactory:

“Assay for alkaloids. Sample, 20 grammes of finely powdered. Place in a dark glass bottle, add 180 mls of ether and 10 mls of saturated solution of sodium bicarbonate. Shake 4 hours, allow to stand over night. Shake for 15 minutes. Allow to settle. Carefully filter off as much as possible and as quickly as possible through a fluted filter, collecting the filtrate in a 200 mil graduated cylinder. Measure the aliquot and pour into an Erlenmeyer flask. Recover the ether on the steam-bath. Remove the flask from the steam-bath just as soon as all of the ether is off. Place 15 mls of standard acid on the alkaloidal residue in the flask followed by 15 mls of water and 3 mls of chloroform. Boil off chloroform completely on the steam-bath. Titrate back with standard alkali; use methyl red as indicator. Run a blank and make correction, if necessary. 1 mil *N* 10 acid = 0.02752 gramme of alkaloid.”

The processes for fluidextract, extracts and tincture, are similar, making the necessary modifications for the sort of preparations being examined.—*J. Am. Pharm. Assoc.*, 8 (1919), 1006.

(Z. M. C.)

Camphor.—*Formosan Production.*—During the year beginning April 1, 1919, the production of crude camphor at Formosa is expected to be at least 5,291,080 lb. and the following year it is expected to increase this amount by 25 to 50 per cent.—*Chem. and Drug.*, 91 (1919), 1227. (K. S. B.)

Camphor.—*Japanese Exports.*—The Japanese exports of camphor the past three years were as follows: 1916, 5,753,862 kin; 1917, 3,119,915 kin; 1918, 1,764,217 kin. The destinations were as follows:

	(1916-kin)	(1917-kin)	(1918-kin)
British India.....	1,416,041	1,082,490	361,719
Asiatic Russia.....	447,068	65,446	472
Great Britain.....	639,135	145,130	383,911
France.....	379,862	66,618	90,404
United States.....	2,654,438	1,493,135	595,622
Australia.....	92,605	112,400	94,946
Other countries.....	124,713	154,696	237,683

—Chem. and Drug., 91 (1919), 363. (K. S. B.)

Camphor.—*Yield from Algerian Trees.*—L. Musso reports that hybrid camphor trees yielded 5 to 8 grammes of camphor per kilo of leaves and twigs; while *Camphora officinalis* yielded 10 to 13 grammes per kilo.—Bull. sci. pharmacol.; through Chem. Abstracts, 13 (1919), 1742.

Candelilla Wax.—This wax, which is the product of the *Pedilanthus pavonia*, a plant which is found in various Mexican States, has been recommended as a substitute for beeswax in pharmaceutical practice, where its hardness and higher melting point would make it especially serviceable in the preparation of plasters and ointments whose principal ingredient now is beeswax. The plant producing the wax is described as growing to a height of 3 to 5 feet, in the shape of stalks without leaves or thorns, as many as a hundred stalks springing from a single root. The plant contains rubber, but not in sufficient quantities to work. In wax, however, it averages $3\frac{1}{2}$ to 5 per cent. The wax is of a light color and harder and more brittle than beeswax, its coefficient of expansion being very high. It melts from 67° to 80° C., has a sp. gr. 0.9822 to 0.9856; saponification value, 35 to 86.5; hydrocarbons, 42.5 to 59.7, and dissolves in turpentine, chloroform, hot ether, and benzine. The wax, when purified makes the best quality of candles, which are lasting and give a brilliant light. Dissolved in turpentine, it makes an excellent varnish, and is also used in the manufacture of shoe polish. Purified and moulded into phonograph records, the candelilla wax, it is said, will register the sounds perfectly. It is also used in making various kinds of leather greases and lubri-

cants, and can be bleached perfectly white.—Comm. Rep.; through Pharm. Era, 52 (1919), 13.

Cannabis.—*Comparative Activity of Male and Female.*—Quantities of male and female cannabis made into fluidextracts when assayed by P. S. Pittenger according to the U. S. P. biochemical assay process showed an activity of 200 per cent. of U. S. P. standard in the case of the female and 50 per cent. of U. S. P. standard in the case of the male.—Proc. Penna. Pharm. Assoc., 42 (1919), 173. (R. P. F.)

Cannabis Indica.—*Prohibition of Cultivation in Greece.*—It is stated that the Greek Government is to prohibit the cultivation of *Cannabis indica*.—Chem. and Drug., 91 (1919), 594.

(K. S. B.)

Capsella Bursa-pastoris.—*As Substitute for Hydrastis and Ergot.*—On account of the scarcity of hydrastis and ergot, attention has again been called to *Capsella bursa-pastoris*, shepherd's purse, which grows abundantly in Europe and which can be considered as a perfect substitute for hydrastis and ergot as styptic, especially in uterine and other hemorrhages. C. Grimme, in reviewing the literature on this subject, reports that the active principle of the drug very probably is bursic acid, a substance isolated in 1888 by Bombelon by treating the fluidextract of the drug with lead acetate in the presence of ammonia. Although the constitution and the chemical properties of this acid are very little known. Grimme recommends determining the lead number of a fluidextract in addition to the specific gravity and total solids. The seed of the drug contain 36 per cent. of a fat, which is therapeutically inactive. The presence of allyl mustard oil, of saponins and of the alkaloid bursine, claimed by various investigators, seems to be doubtful.—Pharm. Zent.; through Pharm. Weekblad, 56 (1919), 1421.

(H. E.)

Cassia.—*Hong Kong Exports.* The exports of cassia from Hong Kong were 5,788,819 lb., valued at \$134,329, in 1918, compared to 5,666,866 lb., valued at \$349,968, in 1917.—Chem. and Drug., 91 (1919), 1322. (K. S. B.)

Castor Oil.—*Japanese Exports.*—During 1918 Java exported 560,005 kilos of castor beans and 875,139 liters of castor oil.—Chem. and Drug., 91 (1919), 1517. (K. S. B.)

Cereal Foods.—*Conserving.*—L. F. Kebler, in a lecture, gives a wealth of valuable information about cereal foods, discussing the nutritive value of wheat, maize, rye, barley, oats, rice, buckwheat and millet, as well as some of the forms in which they are used. The entire paper must be read to be appreciated.—J. Am. Pharm. Assoc., 8 (1919), 318. (Z. M. C.)

Chamomiles.—*Scottish.*—H. W. Clair compares the dried flowers of the "single-flowered" variety of *Anthemis nobilis*, known as Scottish chamomile and the "double-flowered" variety of the same plant, known as English chamomile. The Scottish chamomile, formerly cultivated to a considerable extent in the Deeside district of Scotland, is more bitter and aromatic than the "double-flowered" variety and of greater value as an internal tonic medicine. The "double-flowered" variety was not obtained by ordinary cultivation from the "single-flowered" type, but by collecting seed from "sport" plants, and by a careful process of selection from these deviating forms a strain which retained the habit of producing "double" flowers was obtained. The Scottish chamomile is used but slightly outside of Scotland.—Chem. and Drug., 91 (1919), 1512. (E. N. G.)

Chamomiles.—*Single.*—F. M. Holmes comments upon the fact that in the British market matricaria flowers have been frequently substituted for wild or single anthemis flowers. The wild anthemis is known as "Scotch Chamomile."—Pharm. J., 103 (1919), 510.
(C. W. B.)

Chaparro Amargosa.—*Value in Amebic Dysentery.*—Sellards and McIver of the Howard School of Tropical Medicine obtained in 4 cases of amebic infection distinctly significant results when they used this drug.—J. Pharmacol.; through Chem. Abstracts, 13 (1919), 43.

Chayote.—Heber W. Youngken describes the vegetable known as chayote, macroscopically and microscopically with liberal

illustrations.—Proc. Penna. Pharm. Assoc., 42 (1919), 186.

(R. P. F.)

Chenopodium Quinoa.—*Investigation of.*—R. Gonzalez discusses the history, botanical characteristics and uses of this plant. He finds that the seed contain 13.12 per cent. of protein, 52.82 per cent. of starch, 12.2 per cent. of cellulose, 12.5 per cent. of moisture, and 5.44 per cent. of ash. It also contains a bitter saponin possessing antipyretic properties. Its ash contained 1.48 per cent. of silica, 1.05 per cent. of P_2O_5 , 3.01 per cent. of CaO, 1.87 per cent. of Fe_2O_3 , 11.53 per cent. of MgO, and 38.86 per cent. of potassium.—Expt. Sta. Rec.; through Chem. Abstracts, 13 (1919), 1085.

Chillies.—*Zanzibar Output.*—As the natives of Zanzibar have turned their attention to cloves, the production of chillies has fallen from 500,000 lb. in 1905 to 117,040 lb. in 1918.—Chem. and Drug., 91 (1919), 1264. (K. S. B.)

Japanese Chiretta.—*Description of.*—Japanese chiretta, *Swertia chinensis*, has the following appearance, according to Victor Coffman: Stem, 10 to 35 cm. long by 1 to 2 mm. thick, brown or purplish brown, hollow or filled with powdery pith. Root straight or slightly oblique. Leaves opposite, decussate, lanceolate-acuminate, sessile. Inflorescence a panicle, flowers pentamerous. A tincture prepared with 60 per cent. alcohol contained 3.12 per cent. total solids, while the B. P. tincture requires only 1 per cent., and the bitterness of the former is between two and three times that of the latter.—Chem. and Drug., 91 (1919), 824. (K. S. B.)

In an anonymous paper it is stated that it is used in Japan in medicine as a bitter tonic, and was described in a list of Japanese drugs received from Japan by the late Mr. Thos. Christy in 1879. In Japan it is known as Toyaku or Semburi. The plant is about a foot high and bears some resemblance in foliage to our *Erythraea Centaurium*, with flowers somewhat like those of our *Chlora perfoliata*, but having pinkish white flowers striped with purple. The plant is interesting botanically on account of the stigma being prolonged downwards over the edges of the valves of the ovary, whence the name given by Grisebach, *Pleurogyne rotata*. The corolla also has at its base little glands terminating as hairs. Grise-

bach's name is adopted in Franchet and Savatier's "Flore du Japon," but Matsumura in his book, "Index Plantarum Japonicarum," places it under *Swertia Chinensis*, Franchet, and gives as synonyms *Pleurogyne rotata*, F. S., and *Ophelia diluta*, Ledebour, and includes two forms of the plant, viz., f. *vulgare*, Mak., and f. *violacea*, Mak. It is widely spread in Japan, occurring near Nikko, Tokio, Mitsuminesan, Simura, Yohosha, Tahasimura, Kawatsi, and Suoo. The genus *Swertia* is well represented in Japan, as there are eleven other Japanese species. It has been submitted to an analyst in this country and is reported to be more bitter than the Indian chiretta, though there is not, so far as the writer is aware, any published standard of bitterness for comparison. So far as pharmacy is concerned, the short stature of the plant and the larger prominent flowers will serve to distinguish it easily from the Indian *Swertia Chiretta*.—Chem. and Drug., 91 (1919), 733.

Cinchona.—*Assay of Red Bark.*—For the determination of total alkaloids in red cinchona bark, the B. P. method consists in mixing 6 grammes of calcium hydroxide with 10 grammes of the powdered bark and 22 mls of water, and extracting the paste with "benzolated amyl alcohol." W. Partridge obtains better and higher results by reducing the quantity of water used to 12 mls; in this case the mixture forms a powder which is more readily extracted than is the paste obtained in the official method.—The Analyst; through J. Soc. Chem. Ind., 38 (1919) 267A.

Cinchona.—*Cultivation in Bengal.*—Vice Consul Chas. M. Haywood, Calcutta, India, writes that the Government operates two plantations and a factory in Bengal which issued in the period 1915–1918 over 192,000 pounds of quinine. They now have 3,436,000 trees which number they are increasing.—Nat. Drug., 49 (1919), 147. (C. M. S.)

Cinchona.—*Ecuadorian.*—Dr. Rose finds that extensive natural supplies are available in Ecuador. The forests are usually some distance from commercial arteries but, in view of the cheap labor supply, may be profitably worked. Large stocks of bark were found ready for shipment and there is great opportunity for the establishment of factories for the extraction of the alkaloids at the source of supply.—Drug. Circ., 63 (1919), 102. (C. W. B.)

Cinchona.—*Production in Java.*—In 1917 the West Java Cinchona Planting Company had 108 bouws under cinchona cultivation, with further exploitation at Panjairan under consideration. Investigations conducted in behalf of the company by Van Vloten indicated that cleared land had best be used for timber production for about twelve years after removing cinchona, in order to get rid of root canker and to allow the soil to recover the proper texture, while Reynst recommended a long fallow, or planting with albizzias to add nitrogen to the soil, for the same reason. During 1917, 156,571 kilos of bark (52,350 kilos when dried) were harvested, which averaged 6.7 per cent. quinine sulphate, compared with 7.1 per cent. in 1916. The Soekaboem Planting Company, with a productive area of 130,859 hectares, they having 144,468 hectares under cinchona alone, and 13,738 hectares under cinchona intermixed with other crops, reported unfavorable temperature and trouble with fungoid diseases, including "djamoer oepas." Shipping difficulties caused an increase in alkaloid extraction in Java, the deliveries of "quinine in bark" being 146,889 kilos in 1917, compared to 96,072 kilos in 1916, while the shipments to Amsterdam were 348,118 kilos in 1917 and 485,629 kilos in 1916. The stock in Amsterdam on Dec. 31, 1916, was 47,303 bales, with imports of 25,098 bales during 1917. The removals from the warehouses during 1917 totaled 71,017 bales, leaving 1,384 bales on hand Dec. 31, 1917. The sales of druggists' bark during 1917 were 284,312 kilos, containing 7,556 kilos of quinine sulphate. The following are given as the sales of cinchona bark in Amsterdam in recent years:

- 1912. 6,635,401 kilos of bark, containing 398,535 kilos of quinine.
- 1913. 7,771,020 kilos of bark, containing 455,204 kilos of quinine.
- 1914. 7,735,874 kilos of bark, containing 419,306 kilos of quinine.
- 1915. 7,014,498 kilos of bark, containing 418,495 kilos of quinine.
- 1916. 7,893,352 kilos of bark, containing 488,691 kilos of quinine.
- 1917. 5,821,250 kilos of bark, containing 355,674 kilos of quinine.

The exportation of the bark in reduced form, apparently some kinds of extract, to quinine factories, is being considered because of scarcity of shipping space.—Chem. and Drug., 91 (1919), 50.

(K. S. B.)

During 1917 and 1918 the exports of cinchona from Java were:

To	(1917) Kilos	(1918) Kilos
Netherlands.....	951,000	.....
Great Britain.....	900,000	744,000
United States.....	768,000	1,560,000
British India.....	.....	18,000
Singapore.....	50,000	107,000
Japan.....	24,000	415,000

—Chem. and Drug., 91 (1919), 444. (K. S. B.)

Cinchona.—*Variations in.*—Hugo H. Schaefer reports that after the outbreak of war he found many cinchona barks that fell below U. S. P. requirements. Shipping facilities reduced the regular supply from Java and the barks arriving from other sources were low in alkaloids. The U. S. P. IX requires 5 per cent. of total alkaloids, while the U. S. P. VIII required 5 per cent. of total alkaloids and 4 per cent. of ether-soluble alkaloids, the latter being chiefly quinine. Formerly the proportions did not vary much and the omission of the ether-soluble requirement was not so vital. Lately, Mr. Schaefer has found that the total alkaloids may be 5 per cent. with very little quinine or ether-soluble alkaloids. Careful testing of 5 samples showed total alkaloids ranging from 5.08 to 6.01 per cent., while ether-soluble alkaloids were between 2.67 to 3.42. A number of tinctures were purchased on the open market, most of which passed the requirement of U. S. P. VIII (0.75 gramme ether-soluble alkaloids in 100 mls) as well as that of U. S. P. IX (not less than 0.8 gramme nor more than 1 gramme total alkaloids in 100 mls). However, three of these whose total alkaloid was well within the requirement (0.912 to 0.983) showed ether-soluble alkaloids to be very low (0.49 to 0.64). With samples of fluidextracts assayed similarly the same condition existed. U. S. P. VIII required 4 grammes of ether-soluble alkaloids in each 100 mls and U. S. P. IX requires not less than 4 or more than 5 grammes of total alkaloids in each 100 mls. Three samples which contained from 4.01 to 4.61 grammes of total alkaloids showed ether-soluble alkaloids varying from 2.92 to 3.2 grammes. Since quinine is the most active alkaloid and since solubility in ether is a check on quinine content, Mr. Schaefer believes that it would be better to have requirements for both total and ether soluble alkaloids in cinchona and its preparations.—J. Am. Pharm. Assoc., 8 (1919), 11. (Z. M. C.)

Cinchona.—*World Trade in.*—B. F. Howard reviews an article which appeared in the "Bulletin of the Imperial Institute" that contains valuable information and gives a comprehensive résumé on this important subject. The Dutch plantations in Java play an important rôle in this industry. In the last few years Java heads the list of producers with an annual output of 22,880,000 pounds of the bark. The possibility of developing the industry in St. Helena and East Africa appears to be feasible, as the analyses show a high percentage of quinine and up to the Java standard.—*Am. J. Pharm.*, 91 (1919), 231. (J. K. T.)

Cinnamon.—*Dutch East Indies Exports.*—The following report of the exports of cinnamon bark from the Dutch East Indies, expressed in kilogrammes, is given:

To	1913	1915	1917
Holland.....	1,557	.....	.....
United States.....	1,797	.....	1,224
Penang.....	7,300	9,915	3,645
Singapore.....	48,155	30,262	25,030
Hong Kong.....	.....	.....	494
Philippines.....	.....	.....	2,162

—*Chem. and Drug.*, 91 (1919), 649. (K. S. B.)

Coca.—*Javanese.*—Emma Reens gives a detailed study of the cultivation and propagation of the coca tree, together with data on collecting leaves, the extraction and purification of the alkaloid. The author states that while in South America the leaves of *Erythroxylon bolivianum* and *E. peruvianum* are altogether used, in the East Indies, and especially in Java *E. spruceanum* or *E. novogranatense* are cultivated.—*Bull. sci. pharm.*, 26 (1919), 497; through *Bot. Abstracts*.

Coca.—*Exports from Java.*—The exports of coca leaves from Java during 1917 and 1918 were as follows:

To	(1917) Kilos.	(1918) Kilos.
Netherlands.....	13,448	.....
Great Britain.....	4,105	.....
United States.....	151,601	282,555
Japan.....	6,423	211,629

—*Chem. and Drug.*, 91 (1919), 444. (K. S. B.)

Coffee and Its Constituents.—In a series of articles, C. W. Trigg discusses the chemistry of coffee. He believes that the usual methods of analysis of coffee for caffetannic acid are inaccurate; he states that caffeine-free coffee is depressant; he finds that the differences in the aroma of coffee are due to the character of the caffeol present, all so-called caffeols not being identical, that no aromatic oil is found in coffee, but the decomposition of the fat by roasting produces the aroma by the formation of caffeol.—*Tea and Coffee Trade J.*; through *Chem. Abstracts*, 13 (1919), 1107.

Cocoa and Chocolate.—*Rapid Assay of.*—E. B. Hughes proceeds as follows:

To 2 grammes of the finely powdered substance (1 gramme for whole-fat cocoa) add about 30 mls of 50 per cent. alcohol, mix well, and then whirl in a Leffmann-Beam centrifugal machine with glass cylinders holding about 40 mls and decant off the clear liquid, which is rejected. Again add about 30 mls of 50 per cent. alcohol, stir, whirl, and decant as before.

To the residue after alcohol extraction add 25 mls of a mixture of equal volumes of ordinary ether and petroleum ether; stir and mix well for about fifteen minutes, whirl, and decant the clear liquid into a tared flask. Again add 25 mls of ether mixture, stir, whirl, and decant into the flask. Distil off the ether, and weigh the fat in the flask. Two extractions are usually sufficient. The extracted fat is free from impurity.

RESULTS.

A sample of whole-fat cocoa:

By the centrifugal method.....	44.31 per cent. fat
By Soxhlet.....	44.37 per cent. fat

A sample of commercial cocoa:

By the centrifugal method.....	21.15 per cent. fat
By Soxhlet ^(a)	20.85 per cent. fat

A sample of chocolate:

By the centrifugal method.....	31.55 per cent. fat
By Soxhlet ^(a)	31.50 per cent. fat

^(a) The extracted fat was impure and had to be taken up again in ether.

—*Chem. News*, 119 (1919), 104.

Cohune Nuts.—C. N. Willard describes the nuts, the shells of which yielded a charcoal of great value in gas masks.

The cohune (or corozo) nut is a product of the manaca palm, is indigenous to tropical countries, and is found mostly on low, damp lands, along creeks and rivers. It thrives best in the deep forest, and the greatest supply is found in virgin forest lands, of which there are extensive areas in Honduras.

The nuts grow in large oblong clusters, weighing probably 75 pounds each. A single tree will have from one to four clusters on it at a time and with an average production of four clusters (300 pounds) a year to the tree. The nut varies in size from $1\frac{1}{2}$ to 3 inches in length and from 1 to 2 inches in diameter. The shell is hard and dense, with an average thickness of $\frac{1}{4}$ to $\frac{1}{2}$ inch. For cracking the nuts preparatory to extracting the oil, two varieties of machines are used. One is designated a "knuckle" machine, in which the nuts drop from a hopper between heavy knuckles, thus cracking the shell. The other is called an "impact" machine. It operates by a centrifugal motion which propels the nut against the side of a large metal bowl with sufficient force to break the shell. The oil can then be extracted from this copra or crushed product.

The oil is high grade, said to be superior to coconut oil, and finds a ready sale for cooking purposes, the preparation of foods, or any use to which a good cooking oil may be put.—Comm. rep.; through Am. Drug., 67 (1919), 359.

Colza Seed.—*Chinese.*—A. Viehoever discusses the increasing importance of oriental countries as sources of oilseeds. Prior to the war, Chinese and Japanese seeds were practically unknown in U. S. A. But so great is the shortage in Europe that these oil seeds are likely to come into American markets from the Orient for some years. Entering at San Francisco, these Chinese seeds were at first marketed as "Golden Gate" seeds and offered as mustard, to which they bear a striking resemblance in appearance. They are quite lacking in pungency, however, and taste more like cabbage than mustard. The seeds are somewhat smaller than those of white mustard, which they closely resemble except in taste. They were identified as the seed of *Brassica campestris*, var. *Chinensis*, related to the "China cabbage" and "celery cabbage." The microscopic characters are similar to those of the common colzas or rape seeds. They yield 40–50 per cent. of fatty oil similar to that from rape. The marc yielded, upon maceration

with water, from 0.4 to 0.6 per cent. of a volatile oil, identified as "crotonyl mustard oil," found also in rape seed, and quite different in physiological characters from the volatile oil "allyl mustard oil" obtained from the true mustards. Crotonyl mustard oil is but slightly pungent and irritating and is not poisonous, while allyl mustard oil is highly irritating and poisonous. The basal leaves of the young plant are succulent and should be valuable for salad. The plant is hardy and may prove a desirable forage crop. Illustrations of the fruiting plant, the basal leaves and the seeds, both yellow and brown, accompany the article, the complete manuscript of which will be published in a bulletin of the Department of Agriculture.—Oil, Paint Drug. Rep., 96 (1919), 53; through Bot. Abstracts. (W. B. D.)

Cramp Bark.—O. A. Farwell discusses the commercial history of the drug cramp bark and shows that no substitution of mountain maple bark for that of highbush cranberry was ever made but that, on the other hand, the mountain maple bark, from the very earliest times down to 1913, was the only commercial cramp bark known. The opinion is expressed that the name cramp bark, because of long years of use and commercial application, should be retained for the bark of *Acer spicatum* and the more familiar name of highbush cranberry should be adopted for the bark of *Viburnum Americanum*. The paper is concluded by a letter from John Uri Lloyd, giving a detailed account of how the early eclectics obtained their drugs through special collectors rather than from the commercial drug markets of the country.—N. W. Drug., 27 (1919), 245. (O. A. F.)

Croton-Goubouga Bark.—*Chemistry of.*—Goodson and Clewer isolated from the alcoholic extract of this bark an acid, $C_6H_{11}O_5N$, in the form of colorless prisms, melting at 242° and $[\alpha]_D = -85.4^\circ$ (in water). It gave a strong pyrrole reaction and on methylation a mixture of the betaines, betonicine and turicine, was produced, whence it is concluded that the acid is a new optically active 4-hydroxyhygric acid (4-hydroxy-1-methylpyrrolidine-2-carboxylic acid).—Trans. Chem. Soc.; through J. Soc. Chem. Ind., 38 (1919), 791A.

Cruciferæ.—*The Seed Coats of.*—C. Van Wisselingh reports on the microscopical structure of the seed coats of five species of the

Cruciferæ: *Matthiola incana*, *Cheiranthus Cheiri*, *Brassica nigra*, *Sinapis alba* and *Cochlearia officinalis*. It was found that in the seeds the two integuments and the innermost integument and the nucellus are separated in the beginning of the growth by cuticles. The cuticle between the integuments disappears during the development of the seed and in some species this takes place also with the cuticle between the innermost integument and the nucellus. In most cases this cuticle remains and indicates in the ripe seed the boundary between seed coat and endosperm. In the cells which form the innermost cellular layer and the outermost seed coat, always a cork tissue is developed. This also takes place in the cells of the innermost cellular layer of the innermost seed coat and in this case the cuticle between the seed coat and the nucellus disappears. In the ripe seed a cork tissue is developed in the chalaza layer which joins the cork-cell layer and the inner cuticle or both cork-cell layers in such a way that the endosperm and the embryo are covered by cork tissue or by cork tissue and a cuticle. Therefore, not only the tissue which develops from the integuments of the embryo but also the chalaza cork tissue and the tissue which lays outside of this must be considered as seed coat.—Pharm. Weekblad, 56 (1919), 1276. (H. E.)

Cuscuta.—*Medical History of.*—Leclerc reviews the use of cuscuta since the days of Dioscorides; of the two varieties, *C. epithymum* is the oldest one known to have been employed in medicine. Barbey, in 1895, published his investigations, leading to the isolation of a yellow powder, probably a glucoside, which he named "cuscutin;" the latter on boiling with hydrochloric acid yields a resinous body, cuscuretin, and a glucoside. The author has frequently prescribed pills containing 0.1 gramme of extract of cuscuta, two to four daily, or two to four teaspoonfuls of a 2 per cent. aqueous solution of the extract, with excellent results in cases of meteorism, and in intestinal atony, and warmly advocates its use in these indications.—L'Union pharm.; through Chem. and Drug., 91 (1919), 439.

Cytisus Laburnum.—*As a Tobacco Substitute.*—Noting the similar pharmacological action of nicotine and cytisine, H. Fühner suggests the use of laburnum leaves as tobacco substitute.—Ber. Pharm. Ges.; through Chem. Abstracts, 13 (1919), 2414.

Dasheen.—Heber W. Youngken illustrates and gives details of macroscopic and microscopic examination of Trinidad dasheen, the corms of which are prepared and used as food in the same manner as white potatoes and the aerial shoots of which are prepared and eaten like asparagus.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 182. (R. P. F.)

Datisca Cannabina.—*Pharmacognosy of.*—Brandt finds that in the bark of this plant a bast fiber ring is present, but because of the slight elasticity and brittleness of the fibers, the material is unsuited for textiles. On the other hand, the root is diuretic and purgative and contains a yellow dyestuff.—*Arch. Pharm.*; through *Chem. Abstracts*, 13 (1919), 1360.

Digitalis.—*Activity of American.*—Working in the Laboratory of Medicine and the Medical School of Harvard University, J. H. Pratt and H. Morrison determined the activity of various specimens of American digitalis as compared with the English and German drug. The authors used the one-hour frog method of the U. S. Pharmacopœia and emphasize the varying sensitiveness of different species of frogs. As a result of their work, the authors conclude:

“The best American digitalis, both wild and cultivated, is equal in activity to the best European digitalis. Specimens of high potency have been obtained from Virginia, Nebraska, Wisconsin, Minnesota, Oregon and Washington. The majority of samples of American digitalis examined were of low potency. No less than seventeen out of twenty-five samples of American digitalis were below the standard of strength established by the Pharmacopœia. The average strength of the American digitalis, however, was greater than that of the imported digitalis we have examined.

“All digitalis should be tested biologically before it is gathered in large amounts for therapeutic use.”—*J. Am. Med. Assoc.*, 73 (1919), 1606. (W. A. P.)

Digitalis.—*Assay of.*—Sluyters has investigated the statement made by Heffter that by extracting digitalis leaves with absolute alcohol for eight hours in a Soxhlet extractor more active principles are obtained than by Straub's method of fractionated distillation with cold water and 50 per cent. alcohol, and comes to the conclusion that Heffter's method yields a greater proportion of substances

possessing a lethal action on the frog than is the case with Straub's process, which, however, yields more bodies having a specifically digitalis action on the heart. It therefore follows that the extraction with concentrated alcohol yields, in addition to the specific digitalis substances, other bodies lethal to the frog. This finding shows that great care must be exercised in assuming that a greater lethal effect on the frog is a sign of a larger proportion of digitalis bodies, as this conclusion is not always justified, and this can be demonstrated by comparative tests on cats, in which a preparation showing an increased lethal action on the frog is not relatively more lethal to the cat.—Berl. klin. Wsch.; through Chem. and Drug., 91 (1919), 1506.

Digitalis.—*Assay of Preparations of.*—Rapp finds *Rana temporaria* superior to *R. esculenta* as a test animal and states that preparations of digitalis should be dried and dissolved in 25 per cent. alcohol prior to injection. In the test 0.015 mil of solution per 1 gramme of body weight should be injected.—Pharm. Zentralh.; through Chem. Abstracts, 13 (1919), 247.

Digitalis.—*Colorimetric Assay of.*—A colorimetric method for distinction between the water-soluble glucosides and the total glucosides in digitalis is given by Edgar Berry. (1) Remove alcohol from the tincture, and use cold water solutions. Clear the sample with lead acetate, filtering through kieselguhr plates in Büchner funnels. Remove excess lead with sodium phosphate and repeat the filtration. The same conditions and amounts of kieselguhr must be used in each estimation. Evaporate the solution on a water-bath, in the presence of chalk, and purify by solution in methyl alcohol and chloroform and filtration. Precipitate saponin by adding ether, filter and evaporate the filtrate to dryness. At the various stages aliquot portions are taken to avoid loss in filtration, and the experiment is arranged so that the final residue is equivalent to 7.5 mils of the original tincture. The final residue is dissolved in 3 mils of glacial acetic acid, and 0.2 mil of this solution is mixed with 2 mils of Frohde's reagent in a 4 by $\frac{1}{2}$ -inch test tube. Stand 15 minutes and compare the color with the chart. This result is the indication of the amount of water-soluble glucosides present. (2) In this process an alcoholic strength of 70 per cent. is maintained throughout. Clear with

lead acetate, filter through ordinary filter paper to prevent absorption of digitoxin, remove excess lead with sodium phosphate, and evaporate to dryness in presence of chalk. Dissolve the glucosides by repeated extraction with chloroform, bulk the filtrates, filter, and evaporate to dryness. Take aliquot parts as before at various stages, and from this point proceed as in the previous test. The result indicates the amount of total glucosides present. The color in the second test is more reddish brown in cast but it is the density only which is considered. By subtracting the water-soluble glucosides from the total glucosides the "toxic value" is obtained. The water-soluble glucosides are considered by the author to represent the "therapeutic value," and the ratio between the two is calculated. The experiments are then repeated with a standard tincture and the results compared with those from the unknown specimen, when the characteristics of the latter may be deduced.—Chem. and Drug., 91 (1919), 807-8. (K. S. B.)

Digitalis.—*Colorimetric Assay of.*—Gitalin is a chloroform-soluble glucoside of digitalis which possesses strong cardiotonic properties. J. C. Blomberg claims that by assaying this glucoside colorimetrically the activity of digitalis or its preparations can be determined. The reaction, which is a modification of the well-known Keller test for digitoxin, is carried out by shaking the digitalis preparation with chloroform, taking up the residue in glacial acetic acid containing a trace of ferric sulphate and underlaying the solution with concentrated sulphuric acid. A colored ring is found at the zone of contact of the liquids, the intensity of the color varying with the amount of gitalin present.—Pharm. Weekblad, 56 (1919), 790. (H. E.)

Digitalis.—*Comparative Activity of.*—M. S. Dooley in discussing the variation in potency of digitalis preparations points out that the physician has no way of knowing whether a digitalis preparation has been made from leaves of standard potency, whether the leaves were properly stored before being used, or whether the preparations themselves are freshly made or have been properly handled after being made. Lack of uniform potency seems to depend in great degree on the locality where grown, samples showing a variation of 400 per cent. in different localities, and indeed crops in the same location show a wide difference in activity from one year to another; one case cited shows a U. S. P. strength one year

and almost no value the succeeding year. He suggests that physicians need some simple test to prove the digitalis preparations which they use and mentions a simplified form of the "one-hour frog method" as being adaptable to all physicians as no special equipment is needed.—N. Y. Med. J.; through Mid. Drug., 53 (1919), 5. (A. G. B.)

Digitalis.—*Comparative Activity of Leaf Petiole and Leaves of Digitalis.*—Digitalis may be harvested as close to the ground as desired according to P. S. Pittenger, who bases this conclusion on experiments showing that the leaf petioles of digitalis have practically the same physiological activity as the leaves.—Proc. Penna. Pharm. Assoc., 42 (1919), 175. (R. P. F.)

Digitalis.—*Cultivation of.*—W. Straub finds fallacious the idea that second-year digitalis leaves are better than those of the first year. He finds that in well-fertilized soil each plant will yield 600 grammes of fresh leaves and that a yield of 6.5 tons of dried leaves per acre may be expected. One-year plants yield leaves containing 1 per cent. of active glucoside. Fertilization results in increased yield. The stem and skeletal parts of the leaf, hence the use of the leaf tissue, should lead to the preparation of a very active product.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1363.

Koch and Butler think it is possible to grow digitalis successfully on a commercial scale. Where it grows wild a comparatively small amount of attention is necessary to utilize it for commercial purposes. Seeding directly in the field is not satisfactory, as under ordinary conditions weed seeds germinate too readily; in fact it is difficult to find the digitalis plantlets among the weeds. In their experience they found that inorganic fertilizer was essential for the maximum growth of digitalis, phosphorus and nitrogen being the elements most needed. The addition of iron or manganese to the soil did not prove effective in increasing the yield of the plant. The most economical method of obtaining digitalis plants in the green-house is to sow the seed directly in small pots; when they are 2 inches high thin them out to from 3 to 5 plants per pot and then let them grow several weeks

longer before planting them in the field.—Am. J. Pharm., 91 (1919), 211. (J. K. T.)

Digitalis.—*Deterioration of High Test American-Grown.*—J. F. O'Brien and J. P. Snyder report the results of some assays of tincture and fluidextract of digitalis. The first tests were made in 1916 by the U. S. P. frog method, the 24-hour guinea-pig method and the Hatcher and Brody cat method. After two and a half years the tests were repeated. They find the deterioration in tincture and fluidextract to be about the same. The frog method showed the greatest loss, 55 per cent., and the cat method the least, 30 per cent.—J. Am. Pharm. Assoc., 8 (1919), 914. (Z. M. C.)

Digitalis.—*Drying of.*—The best dried digitalis leaves are obtained, says "Able Scholar," by the following process: Cut with scissors, on a dry sunny day, and place flat between the folds of a newspaper, in wooden boxes which are lightly covered, and have perforations in top, sides and bottom. The warmth and darkness preserve the chlorophyll-green color.—Chem. and Drug., 91 (1919), 1128. (K. S. B.)

Digitalis.—*Effect of Drying.*—H. C. Hamilton, noting that the subject of drying digitalis leaves has recently come up and that it has been stated that unless the drug was dried in an oven at 75 to 90° it was practically worthless, conducted a series of experiments, the method of testing being the M. I. D. method originally by Haughton, from the results of which he concludes that oven drying has no advantage over a reasonably rapid air drying and that such drying causes a marked deterioration and, further, that no products more highly toxic than those present in the crude drug are developed during the process of drying.—J. Am. Chem. Soc., 41 (1919), 125. (J. L. M.)

Digitalis Glucosides.—*Elimination from the Organism.*—Hatcher and Eggleston make an exhaustive report on the elimination of digitalis bodies from the animal. They find ouabain disappears rapidly from the circulation of the cat and dog, less than 50 per cent. of a massive intravenous dose being present in the blood at death, which occurs within three minutes. Small amounts can be detected in the nearly bloodless liver, traces are probably ex-

creted by the kidneys and can be found in the brain.—J. Pharmacol.; through Chem. Abstracts, 13 (1919), 2713.

Digitalis Glucosides.—*Adsorption of.*—C. Mannich reports that experiments with gitalin showed the latter to be readily adsorbed from aqueous solution by blood charcoal (the latter can adsorb at least 20 per cent. of its weight), less readily from alcoholic solution, and still less readily from solution in chloroform. A specimen of charcoal containing 20 per cent. of gitalin did not lose glucosides when treated with water and only a portion when alcohol was used, but practically all of the gitalin was removed by chloroform. Other substances, such as fuller's earth, the sulphides, lead, copper and zinc, and particularly those of arsenic and antimony, have the power of adsorbing the bitter principles from an aqueous extract of digitalis leaves. Attempts to isolate the glucosides by treatment of infusion of digitalis with animal charcoal and subsequent extraction of the latter with chloroform did not lead to the desired result, possibly because the principles are not free in the aqueous solution, but in complex compounds with other substances such as tannins. The author considers that the readiness with which the digitalis glucosides are adsorbed by the powdered drug explains the difficulty of their complete extraction and also the better results which are obtained when water, as solvent, is replaced by alcohol.—Ber. dtsch. Pharm. Ges.; through J. Soc. Chem. Ind., 38 (1919), 386A.

Digitalis.—*History of.*—Foxglove does not appear to have been used in medicine in ancient times, and Gerard's editor, Johnson, attributes to a blunder the herbalist's statement that Galen recommends it as serving the same purpose as gentian. It is not always certain what is meant when our oldest writers mention foxglove; *saliunca*, for example, is sometimes classed as "wild popi," as "calketrappe" and as "foxes-glove" but these names cannot all mean the same plant. It is interesting to find a name partly of Greek origin *ceroteca vulpis* (*ceroteca-cheiro theke* which is *hand-case*) in the "Sinonoma Bartholomei," applied to what can hardly be anything else than our foxglove, the history of which, however, it is safest to begin with Fuchsius, who first gave it the name *digitalis*, in allusion to the German *Fingerhut*. The plant was in much use in the seventeenth century as an application to scrofulous and other sores, and our herbalists, many of them, apparently

unaware of its dangers, recommended it internally as a "cleanser" of "tough and clammy phlegms." It did not appear in the first London Pharmacopœia but was introduced, as was also an *unguentum digitalis*, in later editions. It was received into the Edinburgh book earlier than Wootton says, being in the edition of 1735. Withering's book on the subject appeared in 1783, and was noticed at some length in Healde's edition of the London Pharmacopœia of 1788. Healde relates that he was himself dosed with digitalis when a youth (in 1738) with most alarming result, the heart having apparently been strongly affected, and he endorses Withering's caution as to its administration.—Pract. Drug., Sept., 1919, 41.

Digitalis.—*Stability of.*—Schmidt and Heyl after a study of digitalis and its preparations express their belief that the leaf contains a stable and an unstable active constituent. They further believe that digitoxin is the stable and digitalein is the unstable constituent.—Am. J. Pharm., 91 (1919), 425.

Digitalis.—*Standardization of.*—Robert A. Hatcher directs attention to the imperfect absorption of strophanthus. The pharmacopœial dose is the same as for digitalis, but one hundred times the activity is required. If absorption occurred, the patient could not survive what is considered an effective dose. There is danger in its oral administration. Dr. Hatcher goes on to show that not all the constituents of digitalis are readily absorbed. He separates them into chloroform-soluble and water-soluble. "The digitalis in powder is exhausted with water on the water-bath, the infusion is filtered, the filtrate concentrated to a syrupy consistence and precipitated with a large excess of alcohol, the alcohol is expelled, the residue taken up in water and the solution shaken several times in chloroform. The chloroformic solution is distilled and the residue taken up in diluted alcohol." Dr. Hatcher thinks that the higher the digitoxin content, the lower should be the biologic activity measured by the official assay, but the more active by oral administration. The chloroform-soluble fraction is absorbed more readily than the water-soluble and it is nearly certain that its action lasts for weeks where the other lasts days. The author concludes that the chloroform fraction may be made available for intravenous use. Furthermore, he thinks digitalis must be assayed with reference to the percentage of the more read-

ily absorbable fraction.—J. Am. Pharm. Assoc., 8 (1919), 913. (Z. M. C.)

Digitalis.—*Standardization of.*—L. W. Rowe reports the results of experiments conducted in order to determine the relationship, if any, between assays by cat and frog methods; to determine whether the cat method is accurate; and whether it might be made more practical. 61 cats were tested with 18 samples and 132 dogs with 30 samples of ouabain, strophanthus and digitalis and the results are arranged in two tables which give sex of animals, condition, weight, anesthesia, dilution of sample, total dose, time to kill, M. L. D. per kg. Table III gives M. L. D. per kg. for cats and for dogs and the ratio existing. Table IV gives results in cat units and dog units together with M. L. D. by the frog method in heart tonic units. In order to check the results already tabulated, certain lots which had been tested by all three methods were diluted or concentrated, the new strength being unknown to the author until after the completion of the tests. Tables V and VI give detailed reports of these tests as well as the comparison with change in strength. Mr. Rowe believes that he does not have sufficient data to prove that cats are as unsatisfactory as dogs, but the results obtained with frogs and with cats seem inconsistent. The logical conclusion is that "no relationship exists between the M. L. D.'s of heart tonic preparations to cats, dogs and frogs and that consequently, since the frog method has shown itself to be the most accurate by tests of samples of unknown activity, the M. L. D. frog method is the most accurate of the three."—J. Am. Pharm. Assoc., 8 (1919), 900. (Z. M. C.)

Digitalis.—*Varieties of.*—E. R. Saunders studied the genetics of the hairy form (*Pubescens*) and the smooth-stemmed form (*nudicaulis*). These two forms grow together, the latter being less common, and several explanations are suggested of its origin.—J. Genetics; through Pharm. J., 102 (1919), 389.

Digitalis Sibirica.—*Observations on.*—Heber W. Youngken found that a tincture of this drug was three-fourths the strength of the U. S. P. tincture of digitalis. Like all members of the digitalis series of cardiac tonics, when death occurred the heart stopped in systole. Mr. Youngken gives very careful description of the plant

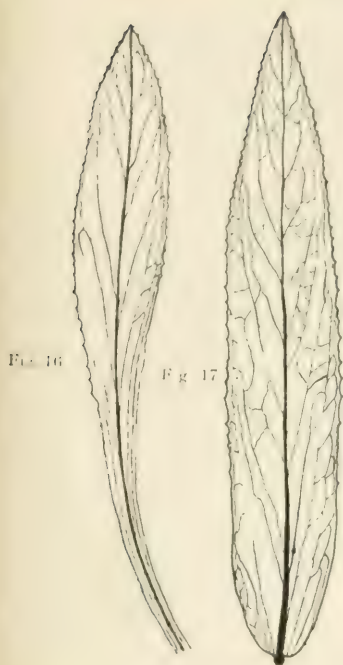


Fig. 16

Fig. 17

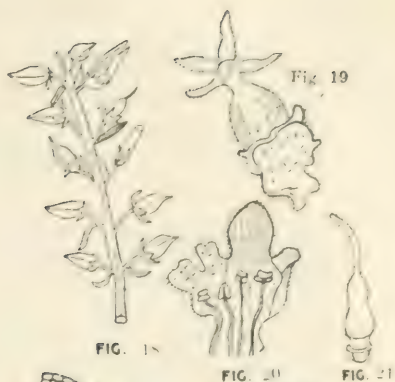


FIG. 18

FIG. 20

FIG. 21

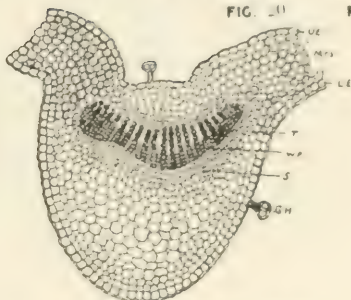


FIG. 23



FIG. 24



FIG. 25



FIG. 22

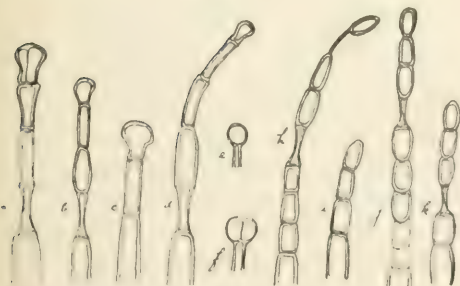


FIG. 26



FIG. 27

Fig. 16—Leaf from basal portion of stem of second year's growth of *Digitalis Sibirica*. Note the winged petiole. Fig. 17—Leaf from portion of stem higher up of *Digitalis Sibirica*. Fig. 18—Terminal portion of inflorescence of *Digitalis Sibirica*. Fig. 19—Flower of *Digitalis Sibirica*. Fig. 20—Corolla tube dissected, showing stamens within. Fig. 21—Pistil of *Digitalis Sibirica*. Fig. 22—Fruit of *Digitalis Sibirica* in process of dehiscing (a), valves of same separated exposing septum, placenta and seeds (b). Fig. 23—Transverse section through midrib region of leaf of *Digitalis Sibirica* showing upper epidermis (ue), lower mesophyll (me), tracheae (T), wood fibers (wf), leptome (s) and glandular hair (gh) (highly magnified). Fig. 24—Surface view of portion of upper epidermis of leaf of *Digitalis Sibirica* (highly magnified). Fig. 25—Surface view of portion of lower epidermis of leaf of *Digitalis Sibirica* (highly magnified). Fig. 26—Several types of glandular hairs found on leaves of *Digitalis Sibirica* (a, b, c, d, e, f, g, h, i, j, k) (highly magnified). Fig. 27—Transverse section of portion of lamina outside of midrib of leaf of *Digitalis Sibirica*, showing upper epidermis (ue), palisade parenchyma (p), spongy parenchyma (sp), lower epidermis (le), stoma (st), tracheae (T), wood fibers (wf), sieve tissue (st), and endodermis, surrounding fibrovascular tissue of vein (en) (highly magnified).

including the histology of the leaf, the stem and the root. (Figs. 16-27.) Previous data have been very meager and this information should be of much value to other investigators.—J. Am. Pharm. Assoc., 8 (1919), 923. (Z. M. C.)

Digitalis Thapsi.—*As Adulterant of Official Digitalis.*—A bale of digitalis leaves received by the Pharmacie Centrale de France was found to contain leaves of *Digitalis Thapsi* L., a plant which is used in Spain as a substitute for *Digitalis purpurea*, and which made its appearance in America in 1916. Guérin made an investigation of this plant, and found that the chief distinction between both varieties is to be found in the hairs of the leaves. In *Digitalis Thapsi* there are practically no simple hairs, both surfaces of the leaf are covered with secretory hairs of varying sizes; a few are short ones with one- to two-celled heads, like those on *Digitalis purpurea*, but the largest number are much longer, composed of three to five thick-walled cells, and terminating always in a one-celled glandular head. Hamilton's investigations have shown that *Digitalis Thapsi* injected into frogs requires a dose three times stronger than that of *Digitalis purpurea* to cause death. Experiments on dogs proved that it has practically no action on the blood pressure, whereby its effect approximates that of *strophanthus*.—L'Union pharm.; through Chem. and Drug., 91 (1919), 1151.

Dittany.—*Adulteration with Calamintha.*—Cretan dittany (*Origanum dictamnus*), a Labiate plant, is little used in France and only occurs in the Codex in the formula for "baume de Fioravanti." This plant, a native of Crete, is official in the pharmacopœias of Denmark, Spain, Mexico, and Sweden. It can no longer be procured in France, but according to M. Guérin there is found in commerce, under the same name, another plant of the same family, *Calamintha candidissima*, which grows in Algeria.

The Cretan dittany is characterized by reddish flower stalks, broadly ovate leaves, the lower being petiolate and the upper sessile, both covered with a dense whitish tomentum. The flowers form pedunculate spikes surrounded by almost glabrous reddish bracts, 7 to 9 mm. in length. Under a lens the leaves are seen to be covered with glandular hairs.

The Cretan dittany possesses an aromatic odor like that of thyme. It has an acrid pungent taste. The hairs which cover both sur-

faces of the leaves are long and easily detached by rubbing. The glandular hairs, abundant on the upper epidermis, are bicellular with an eight-celled head where the secretion accumulates under the much-distended cuticle. These glands are accompanied by a large number of very small secreting hairs having a unicellular head.

Calamintha candidissima, the article which reaches France, consists of short branches and the leaves are whiter than those of Cretan dittany and the odor is less delicate. The hairs which cover the leaves are less easily rubbed off; they are multicellular like those of Cretan dittany, but are shorter and have thinner walls. Their ramifications are more numerous and more complex. The secreting hairs are of two kinds, as in *Origanum dictamnus*, but larger, especially on the ventral epidermal layer. The secreting head may contain as many as sixteen cells.

To sum up, the leaves of *Calamintha candidissima* are always whiter than those of Cretan dittany; they never have reddish bracts; their odor is less delicate.—Rept. Pharm., 30 (1919), 49; through Bot. Abstracts. (N: K.)

Douglas Fir.—*Oleoresin of.*—S. A. Mahood describes the methods employed in gathering this substance. Heretofore there has been little information available in regards to its collection. The oleoresin is obtained in lumbering operations by allowing it to drain into vessels as it exudes from felled trees. Another method is the opening of a pocket which is produced by a wind shake that in time fills up. An aperture is then made by those who make their business to collect material.—Am. J. Pharm., 91 (1919), 345. (J. K. T.)

Dragon's Blood.—*Preparation of.*—Dragon's blood is prepared from the fruits of several varieties of rattan palm. The purest kind is obtained by shaking dry fruits and melting the resin thus freed. But it appears from accounts from Labœan Ratœe, the principal producing district in the Dutch East Indies, that in the small kingdoms Panei, Bila and Kota Penang, where this palm abounds in the marshes, the ripe fruits are put into a pan with water and pounded. The resin is taken up by the water, which is strained to remove the seeds and the skins from which the dye has been drawn. The resin settles slowly at the bottom of the pan; the water is poured off and the remaining dyestuff is

poured into little baskets made of pandon leaves, where it hardens in about ten days.

The East Coast of Sumatra and Djambi are the only sources of export. The markets are Batavia and Singapore. The following figures show the exports for three years:

	1914	1915	1916
East Coast of Sumatra kilos.	34,000	28,000	25,000
Djambi kilos.	3,000	5,000	6,000
Total kilos.	37,000	33,000	31,000

In 1915 about two tons were shipped direct to Europe; in 1915, however, exports were made to Singapore and Penang only. The chief ports for export on the East Coast of Sumatra are Labœan Bilik (14,000 kilos in 1916) and Belawan (8,000 kilos in 1916).—Pharm. Era, 52 (1919), 172.

Ergot.—*Spanish Production.*—The 1918 yield of Spanish ergot will not exceed 5 or 6 tons, compared to 30 tons in 1917, according to the report of the United States consul at Vigo, Spain.—Chem. and Drug., 91 (1919), 18. (K. S. B.)

Evergreen Leaves.—*Starch and Oil in.*—G. M. Tuttle shows that starch is formed in the leaves of evergreens, such as *Linnæa*, at moderately high temperatures. Such starch is converted into oil when the temperature is gradually lowered, and the oil is reconverted into starch when the temperature is again raised. Lipase and oxidases are present in such leaves, and the starch is in a very finely divided state.—Ann. Bot.; through Pharm. J., 102 (1919), 389.

FennGreek.—*Proteids of.*—H. E. Wunschendorff finds that fennGreek seed contain 27 per cent. of proteids consisting of 25 per cent. globulin, 20 per cent. of albumins and 55 per cent. of nucleoproteid. The globulin contains 0.4 per cent. of sulphur; the two globulins contain 0.65 per cent. of sulphur and the alpha form coagulates at 60–61°, while the beta form coagulates at 72–73°.

The nucleoproteid was isolated by the author in pure form and was found to consist of 52.36 per cent. of carbon, 7.27 per cent. of hydrogen, 15.64 per cent. of nitrogen, 1.30 per cent. of sulphur, 18.46 per cent. of oxygen, 1.88 per cent. of phosphorus, and 3.39 per cent. of iron.

On hydrolysis, it yielded no glycocoll or lysine, but 1.60 per cent. of alanin, 7.30 per cent. of leucin, 2.50 per cent. of phenyl-alanin, 35.71 per cent. of glutamic acid, 1.32 per cent. of aspartic acid, 4.65 per cent. of tyrosin, 3.15 per cent. of argenin, 0.75 per cent. of histidin, 3.80 per cent. of proline, and traces of tryptophane.

An alkaline solution of the nucleoproteid had the optical activity, $\alpha_D = -97^\circ 7'$.—J. pharm. chim., 20 (1919), 86.

FennGREEK.—*Saponin of.*—H. E. Wunschendorff isolated the saponin of fennGREEK by first defatting the ground seeds with ether and then extracting the marc with 95 per cent. alcohol in a Soxhlet apparatus. The extract thus obtained upon cooling forms a gelatinous mass, which was collected on a suction disc and dried. The brown dry extract was purified by repeated solution in 95 per cent. alcohol and precipitation with ether until there was obtained a colorless substance, melting at 214 to 215° and leaving no ash upon incineration. This saponin was found to have the formula $C_{40}H_{44}O_{21}$, was quite soluble in water, somewhat soluble in cold alcohol and almost insoluble in ether, petroleum ether, acetone, chloroform, glacial acetic acid, benzene, phenol, and nitrobenzene. For this reason, molecular weight estimations by cryoscopic methods were impossible. The substance showed all of the general properties of saponins; twined with concentrated sulphuric acid, yellow, red, violet and then mauve; and upon hydrolysis yielded a sapogenin and *d*-glucose.—J. pharm. chim., 20 (1919), 183.

Flax Culture.—*Re-establishment in Scotland.*—The flax industry has been re-established on a permanent basis in Scotland. Factories for dealing with linseed have been founded at Leven, Leslie and Markinch.—Chem. and Drug., 91 (1919), 162. (K. S. B.)

Flaxseed.—*Decreased Production.*—The 1919 crop of linseed in the United States is estimated at 2.6 million quintals, or 69.6 per cent. of the 1918 production, and 71.9 per cent. of the average for the previous 5 years. For India the estimate is 2.3 million quintals, which is 44.5 per cent. of the 1918 yield and 48.8 per cent. of the average for the previous 5 years. In Canada the estimate is 2.1 million quintals, or 135 per cent. of the 1918 crop, and 82.5 per cent. of the five-year average.—Chem. and Drug., 91 (1919), 1044. (K. S. B.)

Flour.—*Micro-Detection of Ligneous Elements in.*—It is difficult to identify starch grains in cooked flours and pastry, on account of the distortion of the starch by the action of the heat to which the articles have been exposed in cooking. In such cases the ligneous elements will often afford valuable evidence as to the nature of the starchy material originally used. According to T. Fellenberg, the following method enables these elements to be isolated in a condition favorable for micro-examination. About 0.5 gramme of the flour or pastry is well agitated with 10 mls of 10 per cent. nitric acid, and heated, first on the water-bath for five minutes, then for one minute directly in the flame. The heated mixture is centrifugated and the liquid decanted. The residue is boiled with 5 mls of 10 per cent. caustic soda solution, diluted with 5 or 10 mls of water. After again centrifugating the deposit is suitable for examination. If the pastry is rich in fat this should first be removed by means of suitable solvents, and the fat-free residue treated as above.—Mitt. Lebensmitt. Hyg.; through Pharm. J., 102 (1919), 346.

Garlic.—*Medical Value of.*—Garlic, or Poor Man's Treacle, had formerly such a long list of medicinal uses that the present few survivals need excite no wonder. Diphtheria was unknown as such to our forefathers, but it may have been one of the throat affections for which garlic was prescribed. Garlic was much used for coughs, asthmas, bronchitis and as a detergent for the lungs. For whooping cough it was considered efficacious even when carried about the person. It was good for fevers and inflammations of all kinds, and as protection against foul air and infected water; and it is stated somewhere that the strings of it and onions in the houses of the Italian residents on Garlick Hill (London) kept the great plague at a respectful distance. It was sovereign against poisons, the bite of mad dogs, serpents, and so forth; excellent as a diuretic and stomachic; and, in short, had so many virtues there is not space to enumerate them. "Eat ramsons in May and physicians may play," says the proverb.—Chem. and Drug.; through Am. Drug., 67 (1919), 359.

Gelsemium.—*Use in Influenza.*—Small and Blanchard mention that they had ample opportunity of testing systematically the action of various medicinal agents with a view of determining their relative value in the treatment of influenza. Gelsemium was

found to exert a striking effect, and all recent cases were treated by the authors with the following:

Tinct. gelsemii.....	mxij.
Tinct. belladonnæ.....	mv.
Potass. citr.....	gr. x.
Syr. aurant.....	ʒj.
Aq. chloroform. ad.....	ʒj.

One ounce four-hourly for the first twenty-four hours; thereafter $\frac{1}{2}$ oz. every four hours until temperature is normal.

Gelsemium exerts a marked beneficial action on the course of the disease; it tends to shorten the illness, and it undoubtedly relieves, and that rapidly, the discomfort of the patient, particularly the headache and backache.—Brit. Med. J.; through Chem. and Drug., 91 (1919), 210.

Gentian.—*Pharmacognostic Analysis of Powdered.*—L. Kopfer reports upon an adulterated sample containing 49 per cent. of powdered gentian, 45 per cent. of powdered olive pits, 2 per cent. of powdered wormwood and 42.7 per cent. of tartar emetic. The latter was detected by the microscopic study of the hexagonal crystals of $C_4H_4O_6(SbO)Ag.H_2O$, produced when a concentrated aqueous extract was treated with one drop of 10 per cent. silver nitrate solution.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1364.

Gentiana Asclepiadea.—*As a Substitute for Official Gentian.*—Hoyer and Wasicky find that *Gentiana asclepiadea* contains only half as much gentiopicrin as does *Gentiana lutea*, hence when used as a substitute twice the dose should be employed.—Pharm. Post; through Chem. Abstracts, 13 (1919), 247.

Ginger.—*Constituents.*—Nomura has found that the principle in ginger isolated by Garnet and Grier and named gingerol by Thresh, consists of at least two different compounds, one of which he has named zingerone. This substance occurs as a crystalline solid, melts at 40–41° C. and has the formula $C_{11}H_{14}O_3$. The other constituent named shogaol (from shoga, the Japanese name for ginger) has the formula $C_{17}H_{24}O_3$, and is an unsaturated ketone.—J. Soc. Chem. Ind.; through Drug. Circ., 63 (1919), 552.

Ginseng.—*Constituents of Korean.*—Kondo and Yamaguchi obtained by steam distillation from the ethereal extract of ginseng, a volatile oil and a non-volatile substance, which consisted of a phytosterol melting at 133–134° and of stearic, palmitic and linoleic acids.

From 18 kilos of Japanese ginseng they obtained 10 grammes of volatile oil (C_5H_8)_x, boiling at 140–143° at 20 mm. pressure; at 247° at ordinary pressure; having the density 0.9194 at 15°; optical activity, $\alpha_D = -5.41$; refractive index, $n_D = 1.4945$. The authors find that the ether extracts of both Korean and Japanese ginseng contain the same constituent.—J. Pharm. Soc. Japan; through Chem. Abstracts, 13 (1919), 361.

Ginseng.—*Cultivation in Kentucky.*—According to F. J. Koch, Somerset and Cave City, Ky., seem to be the centers of ginseng raising in Kentucky. Near Somerset there are about five acres of ginseng farms, one of these farms having the value of \$25,000. In the fall of the year, mountain natives bring to these farms "fresh" ginseng roots carefully packed in moss to retain life, for which they receive about \$2.00 a lb. These "fresh" roots are replanted in beds four feet long by two feet wide in rows eight inches apart and each plant stock six inches from its neighbor. After the first season, the plants are thinned out and allowed to grow to maturity, the only care being the removal of weeds and prevention of mice and moles. Dried roots are gathered from the natives by agents of wholesalers; these roots are worth \$3.50 a lb. A pound of "fresh" roots weighs four ounces when dried. The wholesaler ships the ginseng in four to five hundred pound lots in water-tight casks to Hong Kong, China, duty free. Chinese traders, however, pay 5 per cent. import duty to take the ginseng into the Empire proper. About one hundred thousand pounds of cultivated ginseng goes to China a year from Kentucky to be used as a drug.—Am. Drug., 67 (1919), 462. (M. D.)

Ginseng.—*Root-rot of.*—C. L. Zinssmeister describes two species of *Ramularia*, a mildew fungus, as parasitic on the roots of *Aralia Ginseng*. Both species are new, and are the first species of the genus to be found parasitic upon the roots of any host.—Phytopath.; through Pharm. J., 102 (1919), 412.

Globe Hyacinth.—*Use as Indicator.*—The flowers of this liliaceous plant possess a coloring principle which can be extracted by

alcohol, and which, like the coloring matter of mallow, privet and other plants, can be used as an indicator in acidimetry, acids producing a red, and alkalies a green color. Dufilno reports that the indicator acts like litmus with sulphuric acid, hydrochloric acid, oxalic acid, etc., like methyl orange and cochineal with phosphoric acid, and like phenolphthalein and the coloring matter of mallow with boric acid. Alkaline solutions, whether they contain carbonate or not, can be titrated directly in the presence of this indicator. —Bull. Soc. Pharm. Bord.; through Drug. Circ., 63 (1919), 19.

Gobernadora.—*A Mexican Alkaloidal Plant.*—The chemists of the United States Department of Agriculture, in conjunction with the Bureau of Plant Industry, claim to have extracted a new alkaloid from the plant called in Mexico "Gobernadora" (*Covillea tridentata*), which grows in the semi-arid districts of Mexico, New Mexico, etc. The odorous characteristics and medical properties of this plant have long been known to natives and explorers, but it is only just recently that the presence of a new alkaloid has been recognized. The possibilities of this alkaloid in chemical and pharmaceutical preparations are now being investigated. "Gobernadora" is a shrub which grows in vast quantities in the States of Zacatecas, San Luis Potosi, Coahuila, and Durango, a little north of the Tropic of Cancer, in about the same zone as guayule is cultivated. It grows to a height of from one to one and a half meters. It is estimated that a million tons of ashes, rich in potash, can be produced yearly from the green shrub now growing.—Chem. and Drug., 91 (1919), 859.

Guaicum Resin.—*Constituents of.*—Schroeter, Lichtenstadt and Irineu studied guaiene and pyroguaiacin, substances of formerly unknown constitution, obtained by distillation of guaiacum resin. Guaiene was now synthesized and proved to be 2 : 3-dimethylnaphthalene.

Pyroguaiacin is believed to be 6-hydroxy-7-methoxy-2 : 3-dimethylnaphthalene. Guaiaretic acid, extracted from guaiacum resin by ether, was found to have the formula $C_{26}H_{24}O_4$, to be optically active and unsaturated.—Ber.; through J. Chem. Soc. A., 116 (1919), 84. (A. V.)

Hakea Laurina.—*Glucosides of.*—Bourquelot and Herissey studied the aqueous infusion of the leaves of this Australian tree,

now used as an ornamental tree in the South of France and by reading the optical activity of the fluid found that it contained cane sugar and two glucosides hydrolyzable by emulsin. These two glucosides were extracted from the fresh leaves by treatment with boiling alcohol, defecation of the tincture with lead subacetate and final extraction of the residue with acetic ether and a study of their optical rotation and melting point, as well as other tests, showed them to be arbutin and quebrachite, respectively, both of which are found associated in *Grevillea robusta*. (See YEAR BOOK, 1912, 148.)—J. pharm. chim., 19 (1919), 251.

Helianthus.—*Use as Cinchona Substitute.*—A German prisoner of war who has returned from Siberia states that helianthus (species not named, but probably the ordinary sunflower is meant, which is largely grown in Siberia) is extensively used as a substitute for the unobtainable cinchona bark. The leaves and young stems of helianthus are extracted with alcohol, and the resulting extract is used by the Siberian peasants as a prophylactic, and also as a remedy, for malaria. It has been already for many years in use in the fever districts, and the German prisoners speak very highly of its value.—Chem. and Drug., 91 (1919), 1181.

Helleborus Species.—*Anatomy and Microchemistry of.*—Z. Zawalkiewicz gives a review of the genus *Helleborus*, describing ethnology, history, systematics, pharmacochemistry, pharmacology, morphology, anatomy and microchemistry of the different species. The author distinguishes *Helleborus*, *Adonis* and *Actæa* roots and rhizomes by use of Wasicky's reagent (para-dimethylaminobenzaldehyde, 2; concentrated sulphuric acid, 6; water, 0.4).—Pharm. Post; through Chem. Abstracts, 13 (1919), 2729.

Heterodendron Oleæfolium.—*Occurrence of Methyl-levo-inositol in.*—J. M. Petrie finds that this Australian plant is strongly cyanogenetic. It contains the methyl ester of levo-rotatory inositol and the method of extraction and characteristics and properties of the compound are given in detail. The amount isolated was equivalent to 0.65 per cent. of the dried (at 100° C.) leaves. It is not optically isomeric with pinite of Maquenne, which is the methyl dextro-inositol, possessing a different melting point and optical rotation. It is apparently identical with Tanret's quebrachite and has been previously recorded for three plants only—*Aspidosperma quebracho*,

Hevea brasiliensis and *Grevillea robusta*. The occurrence of this compound is exceedingly rare, in contrast to the inactive inositol which is frequently found.—Proc. Linnean Soc. N. S. W., 43 (1918), 850; through Bot. Abstracts, 1919.

Hops.—*Bitter Principles of.*—W. Wöllmer, discussing the bitter principles of hops, $C_{21}H_{30}O_4$ and $C_{26}H_{30}O_5$, state that these are not true acids, but owe their acid character to their hydroxyl groups. He therefore prefers to call them *humulone* and *lupulone*. He split humulone into carbon dioxide, isopentane, and a body, $C_{16}H_{24}O_5$; while lupulone was broken into isopentane and a body, $C_{21}H_{34}O_4$. Both humulone and lupulone on boiling with alkali yield humulin acid, $C_{15}H_{22}O_4$, and an unsaturated acid, $C_6H_{10}O_2$.—Chem. Ztg.; through Chem. Abstracts, 13 (1919), 495.

Hydrastis.—*Berberine Assay of.*—Wasicky and Joachimowitz publish the results of exhaustive work done in connection with the determination of berberine, and the berberine and hydrastine content of *Hydrastis canadensis* grown in Austria. The authors state that no accurate method for the determination of berberine has as yet been developed. The method of Schwickerath and Linde, in which the berberine is precipitated as sulphate, may be employed for practical purposes, although not as accurate as might be desired. The authors claim that more accurate results may be obtained by determining total alkaloids, and deducting from this the quantity of hydrastine as found by means of the pierolonic acid method. For all practical purposes the small quantity of canadine and meconine may be ignored. The authors use the following method for the estimation of berberine, and claim for it accuracy: 6 grammes of the powdered drug are macerated, at ordinary temperature, with 60 grammes of 95 per cent. ethyl alcohol, for a period of not less than 48 hours, with occasional shaking. Fifty grammes of the resulting extract are then removed, and an excess of acidified Mayer's reagent added (50 grammes will constitute an excess). After precipitation is completed, the precipitate is removed by filtration and washed with three portions of 50 mls each alcohol containing a little Mayer's reagent, and then with water to which a small quantity of the same reagent has been added. The filter and contents are then removed to a separatory funnel and shaken thoroughly for about 5 minutes, and after the addition of 5 grammes of sodium chloride and 150 mls of ether,

are again shaken for a further period of thirty minutes. One hundred mls of the clear solution of berberine are then removed (pipette), and an excess of an ethereal solution of picronic acid added. The resulting berberine picronolate is collected in a Gooch crucible and thoroughly washed with ether, dried and weighed. The relation of berberine picronolate is to berberine as 600.25 is to 353.26.

The quantity of berberine and hydrastine found in specimens of *Hydrastis canadensis*, grown in Kornenburg, a town in Austria near Vienna, is as follows: smaller roots: $h = 1.90$ per cent., $b = 2$ per cent.; rootstock, $h = 3.77$ per cent., $b = 3$ per cent.; leaves, $h = 0.77$ per cent., $b = 0.55$ per cent.; axial shoots and leaf stems, $h = 1.12$ per cent., $b = 1.18$ per cent.—Arch Pharm.; through J. Soc. Chem. Ind., 38 (1919), 737A. (G. C. D.)

Hydrastis.—*Large-Scale Extraction of Hydrastine and Berberine from.*—For the extraction of hydrastine, Elsa Schmidt advises percolation of ground golden seal with benzol containing ammonia, the benzol extract shaken with dilute sulphuric acid, the acid washings collected and treated with ammonia which precipitates the alkaloid. The marc is then dried, saturated with hot water, acidulated with acetic acid and macerated a few hours. Percolation is started and the percolate received in a container having concentrated hydrochloric acid in it. Berberine hydrochloride forms immediately. Any free chlorine present can be removed by washing precipitate on a filter with a small quantity of water acidulated with a very small amount of hydrochloric acid. Am. J. Pharm., 91 (1919), 270. (J. K. T.)

Hydrastis.—*Quality of Commercial.*—E. Belloni found market samples of the drug to consist of 48 to 71.4 per cent. of rhizomes, and 2.7 to 5.8 per cent. of leaves and stalks. The percentage weight of the rootlets accompanying the rhizomes ranged from 22.5 to 52. The moisture varied from 10 to 14.87, and did not differ materially in the rhizomes and rootlets. The ash varied from 3.78 to 6.03 per cent. in the former, and from 7.31 to 10.5 in the latter. The amount of hydrastine, found by the method of Dichgans, varied from 2.3 to 2.96 per cent. in the rootlets, and from 3.55 to 3.93 per cent. in the rhizomes. Berberine, determined by Gordin's method, ranged from 2.45 to 3.35 per cent. in the rhizomes.—Bull. Chim. Farm.; through Pharm. J., 103 (1919), 64.

Hyoscyamus Seed.—*Manchurian.*—M. Nakao found that Manchurian henbane seed contain 16.19 per cent. of fatty matter and from an unknown fraction of the seed, he isolated a small amount of hyoscyamine; less than 0.1 per cent. yield from the seed. From wild seed and from Tei-ka-ton he obtained 15.11 per cent. of fat and 0.0254 per cent. of scopolamine. A slight amount of hyoscyamine might be present.—J. Pharm. Soc., Japan; through Chem. Abstracts, 13 (1919), 2970.

Hyoscyamus Niger.—George P. Koch gives in more or less detail his method for the production of a crop of this plant at Glenolden, Pa. He says that variability of seed is always a very important factor. Only germination tests give satisfaction. Most of the viable seeds germinated in from nine to eleven days. He increased the yield of hyoscyamus by employing a carefully worked out fertilizer of chemicals. Arsenate of lead was found to be most useful in controlling destructive insects.—Am. J. Pharm., 91 (1919), 68. (J. K. T.)

Ilex Paraguariensis.—*Seeds of.*—A. Lendner reports on experiments on the germination of these seeds in Switzerland with little success. The article describes the structure of the seed and states that they contain 7.06 per cent. of water, 16.18 per cent. of fat and 0.17 per cent. of caffeine.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 770.

Ilex Species.—*Source of Japanese Bird-Lime.*—Bird-lime is produced in Japan from the decomposed bark, prepared by soaking in water, of the following trees: *Ilex crenata*, *Ilex orthera*, *Ilex latifolia*, all of which are akin to the common holly. Output is about 15,000 kwamme per annum, principal producing places being Kochi, Mizazaki, and Nara. Export goes principally to United States, having gone to Germany prior to the war. Best grades are brownish in color, lower grades being more of a black color. The preparation is chiefly carried on by peasants as a home industry in country districts. (One kwamme = 8.2673 lbs.)—Chem. and Drug., 91 (1919), 1231.

Indigo.—*Indian Cultivation.*—The area under indigo cultivation in India shrunk from 1,688,042 acres in 1897 to 150,000 acres in 1914, says H. E. Armstrong. An increase then set in, and

in 1916-1917 there was three and one-half times as much ground under indigo as in the preceding five years.—Chem. and Drug., 91 (1919), 836. (K. S. B.)

Indigo.—*Madras Cultivation.*—It is estimated that 114,650 acres were under indigo cultivation in 1919 compared to 27,500 acres in 1918.—Chem. and Drug., 91 (1919), 1021. (K. S. B.)

Indigo.—*Preparation of Commercial.*—To make liquid indigo, the indigo plant, after being cut and gathered, is first placed in casks, especially made with plugged holes in the side, which are filled with water. After soaking for a few days, lime is added and, in about one week's time, the stem and branches of the plant are removed. Each day the contents of the cask, after being well stirred and beaten, are allowed to settle and, on the following morning, before the process is repeated, some of the plugs are removed, allowing the water above the sediment which has collected during the night to escape. Gradually, the water is thus eliminated and liquid indigo is found at the bottom of the casks. These casks vary in size, some of them being as large as 12 ft. deep by 10 ft. in diameter and are made of thick pine boards held together by bamboo hoops.—Engineer; through J. Ind. Eng. Chem., 11 (1919), 367.

Insect Flowers.—*Insecticidal Principle of.*—Yamamoto finds that pyrethron, the active principle of *Pyrethrum cineræfolium*, first isolated by Sato, is not a chemical entity, but a mixture. It is so readily altered by heat and air that it has not yet been isolated in a state of purity. On hydrolysis, it yields two alcohols, $C_{21}H_{34}O$, and $C_{27}H_{46}O$, a liquid fatty acid, palmitic acid, and another solid fatty acid. It is saponified by alcoholic potash at ordinary temperatures; its saponification value is 216; and the iodine value 116. The ovary contains the highest amount of pyrethron; the sepals, very little; pollen, stigma, and petals, almost none. More is present in the flowers during blooming than afterwards. In concentrations of above 0.077:100 it checks bacterial growth. This property is destroyed by heat.—J. Tokyo Chem. Soc.; through Pharm. J., 103 (1919), 3.

Insect Powders.—*Adulterated.*—The U. S. Department of Agriculture in a recent bulletin reports that insect powders are

often adulterated with powdered daisy flowers. The adulteration can ordinarily be determined definitely by microscopic examination. The presence of daisy flowers is indicated by fragments of the fruit tissues. Ordinarily the "ox-eye daisy," "field daisy," "white weed" or "marguerite," as it is often called, is used as an adulterant. Mountaineers in some States gather and dry these weeds and deliver them to country storekeepers in exchange for merchandise. In turn, the storekeeper passes on the daisy flowers to drug dealers, who use the material in insect powders in order to cheapen them. This form of adulteration is carried on to a marked extent at present, it is stated.—Am. Drug., 67 (1919), 516.

Ipecac Preparations.—*Solubility of Intestinal.*—T. Sollmann reports that in the administration of ipecac preparations against intestinal amebas, salol coated pills are not always satisfactory, although with due care, it appears quite feasible. He reports that emetine bismuth iodide, which is described in New and Non-official Remedies, is only slightly soluble in water and dilute acid but dissolves quite freely in one per cent. sodium bicarbonate solution. It is somewhat soluble in the stomach and produces some digestive disturbances. Alcresta ipecac, an adsorption product of ipecac and fuller's earth, though sold with the claim that the alkaloids are "physiologically inert as long as they remain within the stomach and are rendered active when set free in the alkaline media of the intestine," was found by Sollmann not to be decomposed with liberation of alkaloid by solutions having the alkalinity of the intestinal fluid. Ordinarily, it would not be expected that a substance which is quite insoluble in the intestines should still be effective on amebas. The findings of Sollmann demand a careful examination of the clinical evidence on which the use of alcresta ipecac is based.—J. Am. Med. Assoc., 73 (1919), 1125. (W. A. P.)

Jamaica Dogwood.—*Standardization.*—P. S. Pittenger and G. Éwe find as a result of chemical and physiological tests that *Piscida Erythrina* (Jamaica Dogwood) cannot be standardized accurately by chemical means because the amount of piscidin in the drug determined by chemical assay, bears no direct ratio to the physiological activity of the drug. A biochemical assay method similar to that given in the U. S. P. for Cannabis was found to yield concordant results and the following standards have been worked out.

Fluidextract of Jamaica dogwood should be of such strength that it will produce inco-ordination in dogs in doses of 0.55 mils per kilo body weight of animal and should not produce inco-ordination in doses less than 0.5 mils per kilo, the drug being administered by capsule after fasting the animal for 12 hours.—Proc. Penna. Pharm. Assoc., 42 (1919), 199. (R. P. F.)

Kauri Gum.—*New Zealand Exports.*—The following report of the New Zealand exports of kauri gum is given:

	Tons to N. S. W.	Tons to U. K.	Tons to Germany.
1907.....	5,171	2,468	936
1908.....	2,855	1,799	667
1909.....	5,127	2,290	639
1910.....	4,149	3,253	913
1911.....	3,514	2,378	1,142
1912.....	3,894	2,468	1,053
1913.....	3,995	3,390	833
1914.....	4,531	3,335	373
1915.....	3,312	1,172	.....
1916 (Jan. to Mar.).....	974	336	.....
1917 (Apr. to Mar.).....	3,158	1,484	.....
1918 (Apr. to Mar.).....	2,316	363	.....

—Chem. and Drug., 91 (1919), 640. (K. S. B.)

Kauri Gum.—*Production of.*—This is a deposit dug from the earth on the site of the old Kauri pine forests in New Zealand. Several thousand years ago the resinous sap from the Kauri pine trees became buried, either by means of earthquakes that rooted up the forests or through other means, and the resin became fossilized.

The Kauri diggers with spear and spade test the earth with the spear, and when experience tells them that gum exists, they dig it up. The pieces of gum range in size from that of a hen's egg to as large as a man's head. Sometimes the gum is found at a depth of a few inches. Other times, as deep as ten or twenty feet.

The New Zealand Government owns three-fourths of the land on which Kauri gum is dug, and no one can dig at the present time without a license. The Government buys the gum direct from the digger and also employs a number of men in "face digging,"

or turning the earth over systematically. About 6,000 men are employed in digging Kauri gum. Live trees have been tapped for gum, but at the present time this has not been developed. The gum is carefully washed and sold to dealers, who grade and pack it for export. New Zealand annually exports about \$2,500,000 worth of this product.

In the making of linoleum the Kauri gum of the very best grade is added to the oxidized linseed oil, when the latter is being prepared for mixing with the cork.—Nairn News; through Pract. Drug., May, 1919, 38.

Labiatae.—*Hesperidin-like Bodies in.*—H. Albertus made a microscopic study of the stems, leaves, and in some cases the flowers of over 100 members of the family Labiatae for the presence of hesperidin-like bodies. When found, their solubility in caustic soda solution, concentrated sulphuric acid, concentrated ammonia and chloralhydrate were determined.—Svensk Farm. Tidskr., 23 (1919), 609. (Bot. Abstracts.)

Ladanum.—*Source and Uses of.*—E. Gérardin presents data on this drug, which is also called *black amber* and *black balsam*, giving the origin etymology of its name, the chemical composition of the balsam, an account of the substances used for adulterating the drug and of the use of the balsam.—Bull. Sci. Pharm., 26 (1919), 289. (Bot. Abstracts.) (H. E.)

Lemon Juice.—*Composition of.*—R. Huerre analyzed the juice of three lemons purchased in Paris on February, 1919. He found that one yielded 95 mls of juice, another 143 mls of juice, while the third yielded 115 mls of juice. The density of the three samples of juice were, respectively, 1.052, 1.048 and 1.064. He also found that 100 mls of juice, 7 to 7.50 grammes of citric acid, 0.40 to 0.60 gramme of malic acid, 0.40 to 0.50 gramme of saccharose, 1.80 to 2 grammes of invert sugar, 0.40 gramme of pectin and gum and 1.60 to 1.80 grammes of ash. The article gives detailed description of the assays employed.—J. pharm. chim., 20 (1919), 5.

Lemon Juice.—*Use in Stomatitis.*—G. Leven states that all forms of stomatitis and glossitis have been frequently cured by

means of fresh lemon juice, even cases which have been refractory to mercurial treatment. The juice of one lemon a day is used. It is expressed from one-half, and used several times daily as an application to the affected area. The other half is cut into thin slices, which are sucked at intervals by the patient. Citric acid, employed in a similar manner, does not give the same results.—*L'Union pharm.*; through *Pharm. J.*, 103 (1919), 64.

Leontopodium Alpinum.—*Effect of Environment Upon.*—O. Rosenheim states that the inflorescence of the edelweiss contains a characteristic chromogene, probably a flavone, soluble in alcohol, 90 per cent. A comparative determination of the amount present in plants grown in London, at an altitude of 80 m., and in those grown on the Swiss Alps, at an altitude of 2000 m., shows that the latter contain four times as much chromogen as the former. This is a striking illustration of the biochemical adaptability of the plant to changed environment. It also supports Shibatas' hypothesis that the flavones in plants are protective in their action against the injurious action of ultraviolet rays, which are much more intense at high altitudes than in the metropolitan atmosphere.—*Biochem. J.*; through *Pharm. J.*, 103 (1919), 217.

Lime Juice.—*British Guianan Production.*—The Government Lime Factory, British Guiana, for the period January 1, 1917, to March 31, 1918, produced 2,975 gals. of concentrated juice which averaged 116 oz. of citric acid per gallon. The oil distilled from the 28,098 gals. of raw juice used amounted to 1,100 lbs., slightly under 4 lbs. per 100 gals., compared to 31½ lbs. the previous year. The fresh juice yielded the larger per cent. of oil, sometimes as high as 4½ lbs. per 100 lbs., while stale juice fell as low as 2 lbs.—*Chem. and Drug.*, 91 (1919), 947. (K. S. B.)

Liquidambar Formosana.—*Resins from.*—Tsuchihashi and Tasaki examined two natural resins from this plant. The first was a solid and gave the following analytical values: Volatile matter 1.42 per cent., ash 0.87 per cent., soluble in ether-alcohol 93.45 per cent., acid value 43.46, saponification value 95.42. An amorphous resin alcohol, melting point 155–162° C., probably identical with styresinol, $C_{16}H_{26}O_2$, was isolated from it. The second resin was semi-liquid and gave 4.64 per cent. of volatile matter, 0.06 per cent. of ash, 82.87 per cent. soluble in ether-

alcohol, acid value 34.17, and saponification value 101.48. This resin gave after hydrolysis 16 per cent. of cinnamic acid, and the presence of cinnamic alcohol and borneol was also established.—J. Chem. Ind., Tokyo; through J. Soc. Chem. Ind., 38 (1919), 646A.

Liquidambar Styraciflua.—*Source and Properties.*—Watermeyer gives an interesting report on *Liquidambar styraciflua*, its habitat and the process of collecting the balsam. He found that the crude product contained 85 per cent. of pure balsam, which had the saponification number of 179 and an acid number of 31. The amount of cinnamic acid was, therefore, considerably low, while the percentage of natural saponifiable, aromatic compounds was high. Since the acid is a decomposition product of these aromatic compounds, and since the latter constitute the chief value of the balsam, American storax must be considered as being just as valuable as the Oriental variety, and there seems to be no reason why it should not be made official.—Am. Perfumer; through Drug. Circ., 63 (1919), 445.

Logwood.—*Commercial.*—In an address before the American Chemical Society, E. S. Chapin stated that the term logwood in the trade stands loosely for a variety of products found in trade that are derived from a tree known botanically as *Hematoxylon campechianum*. The extraction of the dyestuff principles from the tree and the subsequent treatment of the liquor of extraction, are matters of exact technics and considerably influence the results obtained in industry. Logwood extract usually furnished to the trade at a consistency of 51° Tw., is obtained by the concentration under vacuo of the extraction liquors; the coloring principles analyze 85–80 per cent. hematoxylin and 15–20 per cent. hematine. By oxidation of the logwood extract, the hematoxylin is changed to hematine. The hematine pastes of the trade will run anywhere from 45 to 90 per cent. of hematine, the amount of oxidation being determined largely by the purpose for which the hematine is to be used. Logwood extracts and hematine pastes can be brought down to solid or crystalline form, and as such are found in the trade as extract of logwood, or logwood and hematine crystals.—Pharm. Era, 53 (1919), 13.

Loosestrife.—*Use in Infantile Diarrhea.*—At the April meeting of the Académie de Médecine, Dr. H. Dufour directed attention

to the value of fluid extract of loosestrife root for the treatment of infantile diarrhea. It has been given with absolute success in 75 out of 100 grave cases at the Maternité Hospital; and in those instances where it failed there were complications of bronchopneumonia, tuberculosis, or hereditary syphilis. The daily dose for infants is from 8 to 10 grains, or even more, in 24 hours. For adults the dose is 50 to 60 grains daily, for simple diarrhea, dysentery, the diarrhea of typhoid, and similar disorders. The diarrhea is checked without incurring subsequent constipation such as follows the use of many astringents. It is interesting to note that the reputation of *Lythrum salicaria* as a valuable drug has been re-established. At one time this indigenous stream-side plant was highly esteemed, but it has fallen into disuse in rural France.—Rept. Pharm.; through Pharm. J., 102 (1919), 426.

Lupin.—*Alkaloids of.*—O. A. Beath finds that the alkaloidal content of various parts of *Lupinus argenteus* (calculated as lupanine) is: early pods, 0.47 per cent.; late seeds, 0.34 per cent.; early leaves, 0.32 per cent.; late pods, 0.27 per cent.; flowers, 0.23 per cent.; early seeds, 0.12 per cent. The article also gives the lethal dose of the crude alkaloidal mixtures from the different plant parts, when administered to rabbits.—Wyoming Sta. Rept.; through Chem. Abstracts, 13 (1919), 1241.

Lupin.—*Uses of.*—Thoms describes a "lupin" banquet, mentioning some of the various uses to which lupin might be put. At a table covered with a lupin fiber tablecloth lupin soup was served, followed by lupin beefsteak roasted in lupin oil and seasoned with lupin extract. Then came bread containing 20 per cent. of lupin, lupin margarine and cheese of lupin albumin, and finally, lupin liquor and lupin coffee. Lupin soap served for washing the hands, while lupin-fiber paper and envelopes with lupin adhesive were available for writing.—Chem. and Drug., 91 (1919), 5. (K. S. B.)

Lycopodium.—*Use in Microscopy.*—T. E. Wallis points out the value of lycopodium in the study of the size of the elements under the cover glass. He first determined the size of the lycopodium spores and by direct measurement and calculation he found that the spores averaged 0.0000000097 mil and as the density of lycopodium is 1.086 the mass of each spore is 0.00001053 Mg. Hence a milligramme of the powder contains 94,970 spores. He veri-

fied this measurement by 10 readings of four samples of lycopodium, about 1 milligramme of the powder being weighed upon a slide and from the microscopic field the spores in 20 areas were counted. By this method he found that the mean results showed 92,783 spores in each milligramme of lycopodium.

The paper closes with examples of the use of lycopodium as a comparete in the measurement of starch granules and of insect powder.—Pharm. J., 103 (1919), 75.

Malt Preparations.—*Use in Infant Feeding.*—Malt preparations have enjoyed popularity for some time in the feeding of infants. A familiar mixture is the so-called malt soup, the use of which was modified by Keller to include potassium carbonate. The assimilability of maltose has been highly lauded, but the advantage over other carbohydrates has not been definitely proved. Maltose has been vaguely stated to be indicated in the constipation of infants and the retention of calcium facilitated by the use of Keller's formula. However, in experiments on animals it was not found that administration of a base like sodium carbonate produced any effect on the balance of calcium. It has also been reported that in a normal infant the addition of alkali to milk produced an unfavorable effect on calcium retention. Without addition of alkali, malt extract was found to act beneficially on calcium storage, but this is probably not due to the maltose. If malt soup has a favorable effect on calcium metabolism, it is not due to the alkali originally present or added to it. There is no reason at present to attribute the seemingly substantiated benefit from malt preparations on calcium storage to the maltose.—J. Am. Med. Assoc., 12 (1919), 656. (W. A. P.)

Matricaria Dioscoridea.—*As Substitute for German Chamomile.*—A. Walter recommends that this plant should be collected to replace genuine (German) chamomile flowers, which cannot now be obtained in Germany. The plant occurs wild in abundance, has a strong agreeable odor, and contains 0.15 per cent. of volatile oil, which, however, is not identical with that of the chamomile flowers; it is regarded, nevertheless, as possible that the action may be the same as that of *Matricaria Chamomilla*.—Pharm. Ztg.; through Pharm. J., 103 (1919), 217.

Margosa Bark.—*Use as a Quinine Substitute.*—A correspondent in the *Ceylon Observer* draws attention to the value of the bark

of the margosa tree as a substitute for quinine in malarial fever. Fifty years ago, when quinine was selling in Ceylon at the equivalent of 1 l. per oz., a decoction of margosa bark was extensively used by native and European practitioners. Its therapeutical uses are described in Waring's "Pharmacopœia of India." It is suggested that preparations of the bark should be distributed to patients at dispensaries instead of the usual quinine mixture.—Chem. and Drug., 91 (1919), 551.

Marrubium Vulgare.—*Adulterated.*—H. W. Youngken tells of a sample from a shipment of crude drug labeled "horehound herb" sent from a Greek port which was condemned by the Government officials as being adulterated. Close study of the sample showed no presence of foreign leaf or stem but revealed the presence of suspicious calyxes, which were more velvety and broader than those of *Marrubium vulgare*. This was highly suggestive of *Bal-lota hirsuta* and study of a specimen from the herbarium of the Academy of Natural Sciences of Philadelphia, confirmed this view of the author.—Am. J. Pharm., 91 (1919), 147. (J. K. T.)

Mercurialis.—*Toxic to Horses.*—J. A. Hoffman describes eight cases of horses which had eaten hay containing great quantities of *Mercurialis annua*. The symptoms consisted in grave depression of the sensorium, yellow or brownish red tint of the conjunctiva, refusal of food and drink, suppression of the intestinal function, uneasiness, difficult elimination of a small amount of thick brownish red urine, sensitiveness to pressure of the renal region, rigidity of the hind quarters, augmentation of the frequency of the respirations (up to 20 per minute), and of the pulse (up to 90 per minute), and rise of temperature to 103.1° F. The horses were affected in varying degrees; two recovered in three days; two others after two and three weeks, respectively. One of the eight died in twenty-four hours with symptoms of acute colic. *Mercurialis* preserves its toxicity even when it has dried. Some animals show a strange predisposition to the toxic action of the plant; others are much more resistant. According to Schulz, the toxic principle is *mercurialin*, which acts upon the muscles and the nerves of the intestine and the bladder, and also upon the heart. The red tint of the urine is attributed to an indigored pigment contained in the plant. The translator remarks that *M. annua* is found in England, though it is not so generally

common in this country as dog's mercury, *M. perennis*.—Berl. Tierärz. Wschr.; through Pharm. J., 102 (1919), 426.

Mgongo Nuts.—*The Oil of.*—These nuts, which grow plentifully in Northern Rhodesia and which are said to be identical with the manketti nuts of South-West Africa formerly exported to Germany for the extraction of the oil content, have recently been examined. The true kernels, with the seed-coat removed, yield 58.1 per cent. of oil (manketti nuts, 57.2 per cent.), equivalent to 37.8 per cent. of oil from the entire seeds. Owing to difficulties encountered in removing the seed-coat it is considered unlikely that the nuts can be utilized for the production of the oil on a large scale.—Pharm. Era, 52 (1919), 99.

Mistletoe.—*Blood Pressure Reducing Power of.*—Bonnamour and Niquet have studied the pharmacology of extracts of mistletoe from the hawthorn, apple and poplar. While all are blood depressants that from the apple-tree seemed most active. The article gives the method of preparing an extract of maximum potency.—Bull. Sci. Pharmacol.; through Chem. Abstracts, 13 (1920), 497.

Mollugo Nudicaulis.—*A Madagascar Drug.*—Westling examined this plant which is called in Madagascar *aferontany*. In the form of infusion or decoction it is used for whooping cough and for intestinal troubles. The article describes the structure of the root, stem and leaves, numerous white dots on the latter being identified as magnesium phosphate with traces of sodium chloride. From the plant was obtained an acid (presumably tartaric), a bitter glucoside, and a trace of tannin. Alkaloids were absent.—Svensk. Farm. Tid.; through Chem. Abstracts, 13 (1919), 1320.

Mustard.—*Volatile Oil Content of.*—A. Cauda presents a short note on the total content of oil in seeds of different species and of the same species cultivated in different regions. *Brassica alba*, *B. nigra* and *B. carinata* were studied and the determination made by bromine oxydation in a paraffin bath and subsequent weighing as sulphate. *B. nigra* seeds were found to contain a higher percentage of volatile oil than *B. alba* and *B. carinata*, while seeds from plants grown in northern localities contained greater per-

centages than the seeds from plants grown in southern regions. Size of seed seems also to have an influence, the smaller having a higher percentage than the larger.—Stat. Sperim. Agr., Ital., 52 (1919), 122. (Bot. Abstracts.)

Myrrh.—*Constituents of and Tests for.*—A. Christensen obtained by steam distillation of myrrh, 8.76 per cent. of oil. By extraction with petroleum ether he obtained 7.41 per cent. of oil. The steam distillation oil had a density of 1.0132 at 15°; n_D , 1.4979 20°; α_D , —44.66 at 20°; boiling point, about 260°. The extracted oil had a density of 0.9664 at 15°; n_D , 1.5140 at 20°; α_D , —50.03° in ether at 17°; boiling point about 260°. Christensen and Loft studied the effect of aging upon Bonastre's test for myrrh and found it failed after 6 to 10 months, due to the oxidation of the volatile oil. When the powdered myrrh was stored in an atmosphere of oxygen, the test failed to respond in 6 weeks, whereas, when myrrh was stored in an atmosphere of nitrogen, the test was given after prolonged contact.—Arch. Pharm. Chem.; through Chem. Abstracts, 13 (1919), 889.

Myrrh.—*A Preservative of Mucilage of Acacia.*—When used as an adhesive, mucilage of acacia may be preserved by the addition of a small amount of myrrh, says "Abel Scholar." The mucilage remains of a pleasant non-acetous odor.—Chem. and Drug., 91 (1919), 712. (K. S. B.)

Nettles.—*Use in Textiles.*—Because of the great shortage of raw materials for the textile industries, the Danish Nettle Association has twelve traveling exhibitions which are shown throughout the country. The people in the different districts are taught how to prepare the nettles for delivery at the factory. The nettle cloth is snow-white and pliable and is to take the place of cotton and linen for underclothing, bed-sheeting and the like. Nettle fibers are also used in the twine and paper industries. Peat is used in the proportion of 75 per cent. to 25 per cent. of woolen waste for textiles to replace woolen cloth and yarn.—Commerce Reports; through Nat. Drug., 49 (1919), 11. (C. M. S.)

Nux Vomica.—*Crystalline Compound in.*—O. Tunmann reports the presence in nux vomica of colorless felty crystals of chlorogenic acid.—Pharm. Post.; through Chem. Abstracts, 13 (1919), 2961.

Olives.—*Italian Production.*—The Italian olive crop amounted to 1,285,500 tons in 1917, compared to 1,292,200 tons in 1916. The average crop for the years 1909–1916 inclusive was 1,085,400 tons.—Chem. and Drug., 91 (1919), 198. (K. S. B.)

Opium.—*Assay of the British Pharmacopœia.*—Annett and Lingh carried out investigations which show that the B. P. method, originally devised for the analysis of opium containing about 10 per cent. of morphine, will, when suitably modified, give satisfactory results with smaller weights of opium down to one-quarter that suggested in the Pharmacopœia.—Pharm. J., 102 (1919), 9.

Opium.—*Assay of Indian.*—Rakshit and D'Costa compared results obtained by the lime and polarimetric methods of estimating morphine in opium, and, as a result of their experiments, they are of opinion that the polarimetric method offers certain advantages.—Chem. and Drug., 91 (1919), 601.

Opium.—*Assay, with Ethyl Acetate as Solvent.*—Ethyl acetate is used in place of ether in the determination of morphine in opium by the methods of the German, Swedish, Belgian and other pharmacopœias. As a rule it gives slightly lower values, which may be attributed to hydrolysis of the ethyl acetate by the excess of ammonia, especially when the solution is left for a long time in contact with ethyl acetate, as in the method of the Swedish Pharmacopœia.—Pharm. Zent.; through Pharm. Era, 52 (1919), 175.

Opium.—*Microtitrimetric Assay.*—G. Soederberg treats 1 gramme of powdered opium with 8 grammes of water during two hours at 50°; filters through cotton; treats 6 grammes of the filtrate (0.697 gramme of opium) with 0.5 mil of 10 per cent. ammonia water; filtering and treating 4 grammes of the filtrate (0.43 gramme of opium) with 1.5 mils of ethyl acetate, 1.25 mils of 10 per cent. ammonia water and after shaking for 10 minutes adding 3 mils of ethyl acetate. The next day carefully collect the morphine crystals washing with water saturated with ethyl acetate, and finally dissolve the alkaloid in a known amount of N/10 hydrochloric acid, titrating excess acid with N/10 alkali, using methyl orange as indicator.

The paper also gives modifications necessary to use this assay

for *extract of opium* and for *tincture of opium*.—Farm. Revy.; through Chem. Abstracts, 13 (1919), 2964.

Opium.—*Cultivation in Salonica.*—The crude opium trade of Greek Macedonia is second in importance only to that of tobacco. In a normal year the declared export returns of this article to the United States show an average shipment of 160,000 lbs. During 1917 American firms were able to purchase only 18,907 lbs. As communications with the chief opium producing centers have been interrupted, it is impossible to estimate the production in those countries during the past year. The only available information is that concerning the crop in the regions of Langaza, and the peninsula of Chalchidice, the only districts in Greece raising the poppy in 1917. These regions produced about 1,000 okes (2,820 lbs.) of opium, representing about 20 cases. Conditions for the sowing of the poppy during the fall of 1916, and the harvesting of the crop in June and July of 1917 were unusually favorable. Prices, which opened in June with the rate of 101 drachmas per oke (\$7.53 per lb.) for very moist opium, or about 130 drachmas per oke (\$8.90 per lb.) for opium of normal degree of moisture, had risen to 404 drachmas per oke (\$27.65 per lb.) in November, and at the present time sellers are demanding 460 drachmas per oke (\$31.48 per lb.). A stronger price increase is foreseen, both on account of the scarcity of the article and the fact that the drought this last year prevented the sowing of poppy. If foreign countries have urgent need for the article, as high as 450 drachmas per oke (\$38.80. per lb.) cash will have to be paid, and at that rate only a few cases are for sale. To obtain a larger quantity a higher price must be paid. The holders are little inclined to deplete their stock, knowing that the world's consumption is several thousands of cases annually, while the entire disposable stocks in Salonica amount to only 84 cases. The local market and that of Persia have been the only ones supplying the world demand for more than two years. On account of the difficulties of transportation and the reported enormous reduction of the Persian crop, consumers will have recourse to the local market because the quality of the Macedonian opium is preferred by all drug manufacturers.—Oil, Paint, Drug. Rept.; through Pharm. J., 102 (1919), 51.

Opium.—*Cultivation in South Serbia.*—According to J. Frushkoogoraz, most of the Salonica opium is grown in South Serbia.

The best yield is 16 kilos per hectare and the total 1915 production was 125,000 kilos.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 770.

Opium.—*Egyptian.*—The area devoted to the cultivation of the opium poppy in Egypt has varied from 5000 acres in 1833 to 1500 acres in 1917. The plant cultivated is usually the variety with white petals, but the one with red flowers is also grown. The chief localities are the islands of Upper Egypt, which are covered by inundations. The seed is sown between the middle of October and the end of November, the harvest taking place in the following February and March. The inspissated juice is collected by knives moistened with saliva, transferred to shells, plates, or poppy leaves, and, after about a fortnight's drying, made into cakes weighing from 15 to 250 grammes, which are then further dried. Cakes of 300 to 500 grammes, and sticks 20 to 30 centimeters long, wrapped in red paper, in imitation of Persian opium, are also found in the markets, but these are adulterated. The usual morphine content is 7 per cent., but 10 per cent. is not uncommon, and even 12 to 15 per cent. has been found. The cultivation is free, but trading in opium was prohibited except by certain authorized merchants. These authorizations were withdrawn in 1913. None is exported. It is, however, sold clandestinely.—Rept. Pharm.; through Pharm. J., 102 (1919), 219.

Opium.—*History of Its Chemistry.*—Jernstad has sought to solve the debated question of who was the original discoverer of morphine, and comes to the conclusion that Derosne first published a note on the isolation of morphine from opium in 1801. The presence of meconic acid was first established by Séguin in 1804, and the hypnotic action of morphine was established by Sertürner in 1806, and the latter also demonstrated that morphine was an organic base—*i. e.*, an alkaloid.—Schweiz. Apoth. Ztg.; through Chem. and Drug., 91 (1919), 1506.

Opium.—*Illicit Use in China.*—Y. C. Wong gives an important paper on the smoking of opium in China giving history of the poppy, Chinese synonyms for smoking opium, the social side of opium smoking and the attempts of the Chinese government to suppress the vice.—Am. J. Pharm., 91 (1919), 776.

According to a note in the daily press, the Chinese government has decided to destroy 12,000 chests of opium which was intended for exportation from their country, the value being assessed at £2,800,000. It was at first proposed that this vast stock of opium should be gradually absorbed by the arts and industries, but the Chinese authorities feared that unscrupulous persons getting possession of the opium might dispose of it for illegitimate purposes. Measures have also been taken to prevent the manufacture of opium in the republic, and persons found with the drug in their possession are to be severely punished.—Pharm. J., 102 (1919), 7.

Opium.—*New Constituent of.*—Rakshit has isolated a new alkaloid from Indian opium which has been named porphyroxine. It occurs in the form of yellow prisms, has the formula $C_{19}H_{28}O_4N$ and melts at 134–135°. It is fairly soluble in water, and its solutions in mineral acids on exposure to the air assume a characteristic porphyry color. This alkaloid should not be confounded with a mixture of bases to which Merck in 1837 gave the name porphyroxine.—J. Soc. Chem. Ind.; through Drug. Circ., 63 (1919), 504.

Opium.—*Regulation of Trade in Germany.*—The trade in opium, its alkaloids, and the preparations and compounds of these substances has been put under restriction in Germany. Stocks must be declared, a license to deal must be taken out, and separate books must be kept. The latter two rules do not apply to pharmacists. Pharmacists and directors of scientific institutions must secure a specially written license to purchase certain named preparations from special wholesalers.—Chem. and Drug., 91 (1919), 344. (K. S. B.)

Opium.—*United States Imports from Greek Macedonia.*—During normal times the Greek Macedonian shipments of opium to the United States were about 160,000 lbs. During 1917, however, only 18,907 lbs. were obtained by United States buyers. The only information concerning the 1918 crops comes from the regions of Langaza and the peninsula of Chalcidice, these sections producing about 2,820 lbs.—Chem. and Drug., 91 (1919), 18. (K. S. B.)

Orange and Lemon Peels.—*Treatment of Sores from.*—When the skin is inflamed or broken over acid “holes” or ulcers caused by working with orange or lemon peelings, or when eczema appears,

bathing the sores in a solution of 1 ounce of sodium bicarbonate in 1 pint of water is recommended.—Chem. and Drug., 91 (1919), 450. (K. S. B.)

Orthosiphon Stamineus.—*Constituents of.*—L. van Itallie discusses this plant; the leaves of this labiate plant were first imported from Java into Europe as a remedy for diabetes in 1886, and were described in the pharmaceutical papers at the time, but have apparently never been utilized in this country. That the drug is esteemed of importance and believed to possess medicinal value, and that it is still used in Holland, is evident from the restriction placed on its exportation. It was examined by Dr. L. van Itallie, who found it to contain a non-nitrogenous glucoside and a small quantity of volatile oil. This glucoside, to which the name of "orthosiphonin" was given, has a bitter taste, followed by sweetness. It is freely soluble in absolute alcohol, but less so in weak alcohol, and is not precipitated by tannin. Probably it is held in aqueous solution in the leaves by some other body present in them. But as it is widely distributed in the East, in British Dominions and Protectorates, etc., the restriction will not affect England. The leaves are pale green, with a purplish stalk and veins, and prominent oil gland on both sides. On the Continent the herb is met with in the form of rolled leaves like tea. A tincture is prepared with 1 part of leaves to 10 of rectified spirit, macerated for ten days, and then expressed. An extract is prepared by pouring boiling water on the leaves, macerating for twenty-four hours, expressing the liquid, and again macerating the leaves with half the quantity of water and concentrating the liquors. A kilo of leaves yields 195 grammes of extract.—Chem. and Drug., 91 (1919), 580.

Pecan Nut.—*Astringency of.*—Josiah C. Peacock and Bertha L. DeG. Peacock report the results of their investigations on the astringency of the pecan nut which led them to the conclusion that the astringency is due to a soluble substance, tannin or phlobaphene. This substance is present in the partitions and lining between and about the kernels to an extent of more than 35 per cent. and probably nearer 50 per cent. Because of this richness in tannin, the partitions of the pecan nut furnish a convenient supply of astringent principle for gargles, lotions, mouth washes, injections, etc.—Proc. Penna. Pharm. Assoc., 42 (1919), 191. (R. P. F.)

Pepper.—*Microchemical Detection of Piperin in.*—O. Tunmann places a little dry pepper (powdered or a section) under a cover glass and adds ethyl acetate from the side, mixing by partly raising one side of the glass once. The solution of piperine immediately "creeps out" from under the glass yielding a yellow zone visible to the eye. Crystals of piperine may be viewed in this zone by means of a magnifying glass. Colorless, flat monoclinic prisms grouped in star-like forms, 150–250 μ long and 40 μ wide which shine in all colors with crossed nicols, and possess for the most part oblique, only a few parallel extinction. The reaction is sensitive to 0.002 gramme of the powder.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2940.

Peppermint.—*Cultivation in Holland.*—Two lots of peppermint herb cultivated in the experimental garden in Walcheren yielded 0.7 and 0.95 per cent. of oil, which in every respect compared favorably with oil obtained from peppermint grown in Wayne Co., Mich. The following constants were obtained:

	American oil	Dutch oil (first lot)	Dutch oil (second lot)
Optical rotation.....	—18° to —34°	—29.2°	—29.0°
Specific gravity.....	0.900–0.915	0.907	0.905
Refraction index.....	1.460–1.463	1.4621	1.4615
Solubility in 90% alcohol.....	1/2 vol.	1/4 vol.	1/4 vol.
Solubility in 70% alcohol.....	2.5–5 vol.	4.25 vol.	3.5 vol.
Menthol ester.....	5–9%	6.7%	5.9%
Total menthol.....	48–63%	63.4%	61%

Odor and taste were excellent.—Pharm. Weekblad, 56 (1919), 41, (H. E.)

Peru Balsam.—*Physical and Chemical Constants of.*—The method for the determination of the iodine value of cinnamein by Hanus, as at present employed, is unsatisfactory and furthermore may be entirely inadequate as an index of the character of pure Peru balsam. The employment of such physical constants as viscosity, surface tension, optical rotation and refractometer observation may prove of value in the final interpretation of the character of Peru balsam.—J. Assoc. Agric. Chem., 3 (1919), 194. (Bot. Abstracts.)

Peru Balsam and Tolu Balsam.—*Test for.*—When one drop of Peru balsam is allowed to come in contact with a solution of one

drop of sulphuric acid in 15 mls of glacial acetic acid no color is produced, even after 24 hours, when the balsam is pure, according to Macri. When, however, a two per cent. solution of balsam of tolu in acetic acid is mixed with an equal volume of the above reagent a yellowish brown or red-brown color is produced in the mixture.—Bull. chim. farm.; through Drug. Circ., 63 (1919), 381.

Peucedanum Sativum.—*Constituents of.*—H. W. Van Urk reports that the fruit does not contain volatile bases, as claimed by Wittstein. The root is free from those substances which are present in the root of *imperatoria*, which is probably related to the fact that *peucedanum* is a biennial, while *imperatoria* is a perennial. The root contains much fatty material, starch, cane-sugar, and other sugars, and small amounts of an alkaloid (which is present in all parts of the plant) and of a crystalline substance that is insoluble in water and benzine, but soluble in ether. Glucosides are absent.—Pharm. Weekblad, 56 (1919), 1391. (H. E.)

Pinus Ponderosa.—*Oleoresin of.*—Miller and Lynn find that the bulk of the volatile oil obtained by steam fractionation of the oleoresin of *Pinus ponderosa* is beta-pinene or nor-pinene but the presence of alpha-pinene is shown by its crystalline derivatives. The presence of other well-known constituents of coniferous oils seemed to indicated but they were unable to identify them.—J. Am. Pharm. Assoc., 8 (1919), 103. (Z. M. C.)

Poglus.—*Identity of.*—The Huron Indians of Lorette, Province of Quebec, have been using the root of Poglus with wonderful success against epidemic influenza. L'Abbe F. X. Burque had identified it with *Angelica atropurpurea* L. E. C. Marie-Victorin accompanied by M. Edouard Laurin visited Bastien, the local Indian chief, who pointed out a young specimen of Poglus which had not yet its radical leaves. The abundant pubescence showed it could not be *Angelica*. Further examination convinced him it was *Heracleum lanatum* Michx. (Berce laineuse.) Chief Bastien insisted on the powerful febrifuge properties of the plant, and cited extraordinary cases of cures. It was believed to be the cause of the protection of the tribe from the epidemic. The Hurons collect the root in autumn, and use the infusions.

The author then quotes authorities on the properties of *Heraclium*, notes its distribution, and describes its appearance and habitat.—*Naturaliste Can.*, 46 (1919), 121. (Bot. Abstracts.)

L'Abbe Burque responds to the foregoing, criticizing the determination of the species by Frere Marie-Victorin. He winds up an interesting discussion by the presentation of evidence that the Indians of the region (the Hurons of Lorette) have actually been calling no less than three species of the *Umbelliferae* by the same name, "Poglus," namely, *Archangelica atropurpurea*, *Ligusticum* and *Heraclium*.—*Naturaliste Can.*, 46 (1920), 145. (Bot. Abstracts.)

Poison Ivy.—*Treatment of Rash.*—Of service in this trouble is the local application of a solution of soda bicarbonate, six drachms; powdered borax, two drachms; carbolic acid, two ounces, in one quart of rose water. The mixture is filtered before being used and applied freely. If the inflammation is great a cloth wet with the solution may be kept in contact with the parts affected.—*Med. Summary*; through *Pract. Drug.*, Oct., 1919, 36.

Poison Oak.—*Treatment of Rash.*—A physician committed the indiscretion of stating over his name and address in the *Medical World* that he sought a cure for the effect of poison oak. Among the many things recommended to him by his brother practitioners were homeopathic tablets of *Ledum palustre*, 3x, one every two hours; and bathing with diluted nitric acid five or six times a day, and a few drops of the same, in water, daily. Each of these two remedies was offered by its sponsor as a specific.—*Drug. Circ.*, 63 (1919), 228.

Polygonum Species.—An exhaustive microscopical and phytochemical study on various members of the Genus *Polygonum* is given by Miss A. J. Steenhauer. For the botanical part of the investigation the original should be consulted, which gives an abundance of microscopic pictures of the different parts of the plants. Chemically it was found that *Polygonum Sachalinense* contains quercetin and rheumemodine and probably emodine monomethyl ether. A part of the emodine seems to be present in the form of a glucoside. Furthermore the drug contains glucose, fructose, myricyl alcohol and a phytosterol. *Polygonum Con-*

volvulus contains rheum emodine, partly in the form of a glucoside, and rutin. Further potassium bitartrate, potassium nitrate, glucose, fructose, myricyl alcohol and a phytosterol. *P. hydropiper* well known by its acrid taste was found to contain acetic, formic and valeric acids, tannic acid, potassium nitrate, gallic acid, malic acid, melissic acid, glucose, fructose and a phytosterol. The acrid taste of the plant is due to the presence of a volatile oil. The author examined various Polygonaceæ for the amount of oxymethylantraquinones present and found *P. Convolvulus* to contain 0.025 per cent., *P. dumentorum*, 0.02 per cent., *P. Sachalinense* 0.08 per cent. and *P. Seboldii* 0.02 per cent. The method for estimating these was as follows: 0.6 gramme of the finely powdered drug is refluxed with 15 mls of diluted sulphuric acid. The mixture is transferred with the aid of a little water to a bottle, shaken well with 90 mls of benzene and allowed to stand for three hours. After the addition of 3 grammes of tragacanth the mixture is shaken again and 75 mls of the clear benzene solution is shaken out with several portions of 5 per cent. caustic potash solution until the latter is no longer colored red. The combined alkaline solutions are then diluted with water to a definite volume and the color of the solution is compared with alkaline emodine solutions or nickel solutions of known strengths.—Pharm. Weekblad, 56 (1919), 1084. (H. E.)

Poppy Capsules.—*Morphine Content of.*—A. Heiduschka made 6 determinations of each of 2 commercial samples of ripe poppy capsules and found that 1 sample contained 0.017 per cent. of morphine, while the other contained 0.0681 per cent. The assay method employed was that of Heiduschka and Faul (See YEAR BOOK, 1917, 432). The alkaloid being determined colorimetrically. No morphine could be detected in 30 grammes of the seeds of the ripe capsules.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2971.

Poppy Capsules.—*Ripe and Unripe.*—Zörnig points out that "tea" from finely cut ripe poppy capsules should never be given to small children, since alkaloids are present. The microscope will distinguish between ripe and unripe capsules, both of which should be eliminated from all pharmacopœias.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 770.

Populus Species.—*Biochemical Assay of.*—M. Bridel applies to the branches as well as to the separated bark and wood of several species of *Populus*, his biochemical assay, based upon the reading of the optical activity of freshly prepared aqueous extract (all based upon the ratio of 100 grammes of the fresh branches in 100 mls of fluid) followed by polariscopic reading of the same fluid after treatment with invertin and then after treatment with emulsin. The results, presented in the article, in tabulated form are summarized as follows.

The branches and separated bark and wood of *Populus pyramidalis*, *P. canadensis*, *P. alba*, *P. tremula* and *P. nigra* contain new sugars, some of higher some of lower optical activity than saccharose. *Populus pyramidalis* contains a glucoside of marked reducing power, existing however only in the bark. The same is true of the glucoside of lesser reducing power found in *Populus nigra*.

The glucoside found in *Populus canadensis* (apparently salicin is likewise existent only in the bark as is true of the salicin found in *Populus alba* and *Populus Tremula*.

The wood of the last two species contain a glucoside of feeble reducing power, that is perhaps identical with the glucoside of *P. nigra*. The article has an admirable historical account of salicin and populin, with many bibliographical references.—*J. pharm. chim.*, 19 (1919), 429, and 20 (1919), 14.

Potatoes.—*Toxic to Horses.*—The death of twelve horses which had been fed for some time on a diet in which potatoes predominated was said by John McFadyean and other veterinarians to be caused by the alkaloid content of the eyes of the potatoes.—*Chem. and Drug.*, 91 (1919), 936. (K. S. B.)

Prune Kernel Oil.—Fordyce and Torrance extracted prune kernels and obtained 42 per cent. of an oil, one-third of which deposited as a solid mass when the liquid was cooled to 5° C. The solid mass resembled palm-kernel oil and had a specific gravity of 0.9055 and a saponification number 239.8. The liquid portion had a specific gravity 0.9119 and a saponification number 207.4. The original kernels contained 2.47 per cent. of nitrogen, the fat-free residue, 2.21 per cent. The kernels yielded to water 37.4 per cent. of sugars, chiefly levulose and dextrose.—*Chem. News*; through *Drug. Circ.*, 63 (1919), 444.

Pyrethrum.—*Effect of Storage, Heat and Moisture on.*—The experiments of W. S. Abbott on whole and ground flower heads of *Pyrethrum cinerariæfolium* showed that their efficiency as an insecticide was more lasting in the whole than in the powdered conditions.—U. S. Dept. Agric. Bull., 771 (1919), 6. Bot. Abstracts.)

Pyrethrum.—*Italian-Grown.*—N. Passerini finds that both as regards rapidity of action and effectiveness *Pyrethrum cinerariæfolium* is superior as an insecticide to other members of the Asteraceæ. If ground into a fine powder, the heads, foliage, stems and roots of the plant are equally effective; however, the most rapid action is obtained from the heads of the plant.—Gior. Bot. Ital., 26 (1919), 30. (Bot. Abstracts.)

Pyrus Americana.—*Fruit of.*—Vernon C. Shippe analyzed mountain ash berries from Victor, Montana, and found 34 per cent. of sugars (chiefly fructose); 3 per cent. of oil; 2.34 per cent. of acids (chiefly malic, traces of tartaric and citric); nitrogen, 0.57 per cent. The ash contained 1.68 per cent. of SiO_2 , 0.91 per cent. of Fe_2O_3 and Al_2O_3 , 3.36 per cent. of CaO , 5.82 per cent. of MgO , 0.55 per cent. of K_2O , 4.96 per cent. of Na_2O and 29.39 per cent. of P_2O_5 .—Chem. News, 118 (1919), 92.

Ragweed.—*Dermatitis from.*—R. L. Sutton discusses the important part played by anaphylaxis in the causation of various eruptions. Anaphylaxis has been defined as "A state of hypersusceptibility of the organism to foreign substances, which is brought about by the introduction of certain foreign substances and their cleavage products." C. Walker has pointed out that certain proteins, including those of ragweed pollen may cause dermatitis in predisposed persons. The author describes four cases of ragweed dermatitis. In two of them the common ragweed (*Ambrosia trifida*) the mugwort (*Ambrosia psilostachya*) and the bur marsh-elder (*Iva xanthifolia*) probably occupy lesser rôles. All have been shown to cause hay fever. Pollen vaccine treatment gave beneficial results.—J. Am. Med. Assoc., 73 (1919), 1433. (W. B. D.)

Ragweed Pollen.—*The Protein Extract of.*—Frederick W. Heyl has examined the pollen of ragweed for the purpose of isolating

the proteins. The pollen was percolated with ether and with cold 95 per cent. alcohol, and then with water, saline solution and dilute alkali. By this process the yield of protein is not materially decreased, but the nitrogen extracted with cold alcohol is probably less than the quantity found in a hot alcoholic extract (1.08 per cent.). The chief protein is a glutelin extracted with dilute alkalies.—J. Am. Chem. Soc., 41 (1919), 670. (J. L. M.)

Ragweed Pollen.—*The Yellow Coloring Substances of.*—Frederick W. Heyl calls attention to the fact that the yellow-coloring substances of ragweed pollen belong to the flavonols and are entirely glucosidic. They are extracted with alcohol and after preparing an aqueous solution from this alcoholic extract a complete precipitation may be secured with boric lead acetate. The yield amount to about 7.0 grammes from 1150 grammes pollen or approximately 0.6 per cent.

The least soluble of these was identified as a quercetin glucoside having the composition $C_{21}H_{20}O_{10}$, melting at 228° . The only sugar obtained upon hydrolysis was glucose. It is therefore isomeric with and differs from quercimeritin and isoquercetin, which were first isolated by A. G. Perkin from the flowers of *Gossypium herbaceum*. These melt, respectively at 247° and 217° . One other isomere is known having been isolated by Rogerson from the flowers of *Trifolium incarnatum*. Incarnatin melts at 242 to 245° . The most characteristic behavior of pollen quercetin glucoside on melting is the sharp formation of a cherry-red oil at the melting, a peculiarity not noted with any of the above mentioned isomers.—J. Amer. Chem. Soc., 41 (1919), 1285. (J. L. M.)

Quika Resin.—A new product of the Rio Hacha district, Colombia, known as "quika resin," is produced by a small tree, *Cercidium spinosum*, whose trunks and branches and even roots when exposed to the air are covered with a layer of resin. According to Trade Commissioner P. L. Bell, Santa Maris, a single tree yields several pounds, and as the growth is very abundant in certain parts it should prove a valuable article for export. He states that samples have been sent to Europe and the United States for examination and report.—Pharm. Era, 52 (1919), 123.

Resins.—*Action of Alcoholic Potassa on.*—Nicolardot and Coffiquier have studied the action of alcoholic potash on different

resins, heating 1 gramme of the resin for an hour with 25 mls of N/2 alcoholic potash, using a reflex condenser. 50 mls of water were then added and the insoluble residue was filtered off and weighed. Of the twenty-seven different types of resins examined, all but one left an insoluble substance, and the addition of water enabled them to be classified in three groups: (a) Those with which the amount of insoluble product was unaffected by the addition of water; (b) those with which the addition of water led to the total or partial disappearance of the insoluble part; (c) those which showed an increase of the insoluble part when water was added. It appears that the action of alcoholic potash gives rise to resinous soaps, some of which are more soluble in alcoholic potash than in water, while others, on the contrary, are more soluble in water than in alcoholic potash. It is possible that this new characteristic may be employed in the identification of different resins.—Bull. Soc. Chim.; through Chem. News, 118 (1919), 264.

Resinols.—Tschirch discusses the origin of resins. It is well known that fresh tears of (Siam) benzoin consist of a colorless crystalline mass surrounded by a layer of transparent brown substance, which, by the action of air and light, gradually increase in thickness. The pure white surface of a freshly broken tear becomes gradually coated with a similar brown resinous mass. In the brown resin resinotannol is predominant, while the white inner portion consists of, or at least contains, benzoate of lubanol. Lubanol is a resinol, and it is evident therefore that the resinol, which is readily susceptible of change, must be regarded as the mother substance of the resinotannol, and this is probably the case with other resinols. Zinke and Lieb have come to the conclusion that the resinol of Siam benzoin (siaresinol) contains a carboxyl group, and have changed the name to siaresinol acid. Siaresinol and also the resinols from other drugs give the reactions characteristic of cholestol and are undoubtedly closely related to the phytosterin group. This group contains a large number of homologous substances, and members of it are to be found widely distributed throughout vegetable kingdom, so widely that it is doubtful whether any plant is devoid of them. It is probable that the mother substances of the resins are to be looked for in the phytosterins rather than in the tannins. If those resins which contain constituents giving the cholestol reaction are grouped together, it will be seen that they are almost exclusively products of a

secondary flow of resin, and it may be said that the result of the injury to the plant is an abnormal production of phytosterins.—Schweiz. Apoth. Ztg.; through Pharm. J., 102 (1919), 219.

Rheum Undulatum.—*Oxalate Content of Leaves and Leaf Stalks.*—A. E. Tsakalotos found in fresh leaf blades 0.529 per cent. of potassium acid oxalate (KHC_2O_4) and in the leaf stalks, 0.5 per cent. of oxalate. The dried blades contained 5.73 per cent. of oxalate and the dried stalks contained 6.13 per cent. of oxalate. Several cases of poisoning occurred recently in Switzerland, one being fatal.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2416.

Rhubarb.—*Detection of Rhapontic.*—C. Wimmer detects this drug as follows: Mount a little of the powdered drug in water, wash three times by irrigation with more water, finally removing as much of the water as possible; then allow a mixture of 100 parts of 50 per cent. aqueous solution of potash with 5 parts of 100 volume perhydrol to flow on, and allow the preparation to stand for thirty minutes. Particles of the rhapontic powder will then have assumed an intense blue color, apparently due to a granular precipitate, while the particles of other rhubarbs are colorless, or orange-rose, or quite exceptionally reddish violet, but never blue and granular.—Pharm. Post; through Pharm. J., 103 (1919), 217.

Rhubarb.—*Russian.*—From comparisons made of rhubarb cultivated in Russia with the commercial (Shensi) drug, Semmel concludes that the oxymethylantraquinones of both are the same, that the Russian contains more emodin than the Chinese, more oxymethylantraquinones and more anthraglucosides. Considerable quantities of the two last groups of constituents appear to be formed during the drying of the drug.—Arch. Pharm.; through Pharm. J., 102 (1919), 134.

Rhubarb Leaves.—*Poisoning from.*—Several fatal cases of poisoning from using the leaves of rhubarb occurred in this country during the war, and were reported in journals at the time. In consequence, the authorities issued an official warning against the use of the leaves as a vegetable. Several cases of poisoning from the same cause have since been reported on the Continent.

Recently, according to Robb and Sippy, another fatal case has occurred in Montana. In this a woman partook of fried rhubarb leaves for supper in May last. She died, with all the characteristic symptoms of oxalic acid poisoning, within thirty hours.—J. Am. Med. Assoc., through Pharm. J., 103 (1919), 321.

Rhus Species.—*Flavones of.*—Sando and Bartlett, studying the flavones of *Rhus typhina*, *R. glabra* and *R. copallina* have been able to verify the conclusions of Perkins that the same flavone is not likely to be found in both the wood and leaves of the same species. Fisetin is distinctly a wood flavone and would appear to be an end product of metabolism. It is now known to be present in *R. cotinus*, *R. rhodanthema*, *R. typhina* and *R. glabra*. The first two species do not belong to *Rhus* in the restricted sense, but to the genera *Cotinus* and *Rhodospaera*, respectively. The authors' studies are therefore the first to demonstrate the presence of fisetin in wood of species belonging to *Rhus* proper (the true sumacs). The distinctive leaf flavone, probably a plastic substance, of *Rhus* proper is myricetin. It has been known from *R. Coriaria* and the authors have been able to add *R. glabra* and *R. copallina*. The authors have not been able to trace its relationship to the fisetin of the stem, or to the anthocyanins of the leaves and berries. Methods of extracting fisetin and myricetin are fully described. Color reactions and physical properties of both flavones are given along with analytical results for combustions of the acetyl derivatives and the purified flavones.—Am. J. Bot., through Chem. Abstracts, 13 (1919), 2902.

Rice.—*Diuretic Action of.*—E. Doumer points out that during the fifty months of the German occupation of Lille, the inhabitants used rice as chief article of their slim diet and that it was generally observed that increased diuresis was the result.—J. pharm. chim., 20 (1919), 80.

Robinia Pseudoacacia.—*Toxic Constituents of Bark.*—The fresh bark of the Japanese locust tree, *Robinia pseudoacacia*, causes toxic symptoms when eaten by horses, cattle, and other animals. Tasaki and Tanaka found that this was due to a glucoside, "robitin," which was isolated by concentrating an aqueous extract of the bark, clarifying, and precipitating with alcohol. The precipitate obtained, when dried in a vacuum, was a white, hygroscopic,

amorphous powder, easily soluble in water and acids but insoluble in organic solvents. On hydrolysis, it yielded dextrose and rhamnose. The amount obtained from the air-dried bark was 3 per cent. The glucoside contains 2-3 per cent. of inorganic matter. On injection into horses and cows, it produced the same symptoms as the fresh bark, namely rise of temperature, increase of secretions and excretions, and paralysis of hind-quarters.—J. Coll. Agric., Tokyo; through J. Soc. Chem. Ind., 38 (1919), 267A.

Rosin.—*Acids from American and French.*—Knecht and Hibbert, upon repeated extractions and crystallizations with acetic acid and alcohol, have obtained from American rosin a pimaric acid melting at 161° and having the optical activity, $\alpha_D = +79^{\circ}$; and from French rosin a levogyrate pimaric acid melting at 161° and having the rotation, $\alpha_D = -80^{\circ}$. Hence the two acids are evidently optical isomers. Both of these acids on heating *in vacuo* yield anhydrides that resemble rosin; both yield tribromides melting at 115 to 118° ; and nitrosites melting at 99° . The levogyrate acid distilled with aluminum gives a hydrocarbon, $C_{19}H_{30}$.—J. Soc. Dyers; through J. pharm. chim., 20 (1919), 324.

Rosin.—*Melting Point of.*—T. Linsey Crossley states that the melting point of rosin may differ widely depending upon the method used for determining the melting point, and any specification aiming to grade it by reference to its behavior on heating should state the method for obtaining results.

Results obtained by the "Film" method compare very favorably with the "Capillary" method with the advantage of rapidity and ease of manipulation.—Jl. Ind. and Eng. Chem., 11 (1919), 52.
(L. A. B.)

Rubber.—*Cultivation in the Seychelles.*—The rubber industry appears to be progressing satisfactorily, says the Curator of the Botanic Station at Mahé. The Hevea tree flourishes well in the lateritic soils of the Seychelles, and up to the present has proved remarkably immune to disease. It would seem that rubber is to take the place in agriculture formerly held by vanilla.—Chem. and Drug., 91 (1919), 795. (K. S. B.)

Rumex Crispus.—*Proximate Analysis of.*—George D. Beal and Ruth E. Okey summarize the result of their examination of *Rumex crispus* as follows:

1. The following substances are present in the material extracted from the dry root of *Rumex crispus* by cold 95 per cent. alcohol.

(a) *Soluble in water*: A small amount of emodin and a mixture of emodin-monomethyl ether and chrysophanic acid, a pigment which is probably related to the anthocyanins; sugars yielding *d*-phenylglucosazone and having properties indicating the presence of fructose and invert sugar as well as glucose; organic acids and much resinous material. It is more probable that some of these substances are present in the plant in the form of glucosides.

(b) *Insoluble in water*: A small amount of emodin and a mixture of emodin-monomethyl ether and chrysophanic acid; palmitic, stearic and erucic acid together with unsaturated fatty acids of higher molecular weights; a small amount of an unidentified hydrocarbon probably a terpene; an essential oil and a large percentage of resinous material. The presence of glucosides is clearly indicated.

2. The emodin isolated from *Rumex crispus* is identical with that from cascara (*Rhamnus purshiana*) and the phytostyrol has likewise been proven to be identical with the rhamnol from that plant.

3. The yield of emodin from the dried root of *Rumex crispus* amounted to 0.17 per cent. of its weight and that of chrysophanic acid was somewhat less. This compares favorably with the yields from more expensive drugs and it is very probable that methods can be worked out which will, considerably increase this yield.—J. Am. Chem. Soc., 41 (1919), 693. (J. L. M.)

Saffron.—*Pharmacology of*.—Arloing and Maignon reported at a meeting of the Société de Biologie that aqueous extract of saffron administered either by the stomach or intravenously shows distinct toxicity.—J. pharm. chim., 20 (1919), 78.

Saffron.—*Uses in the Orient*.—While saffron has been practically abandoned by medical practitioners, it is occasionally used in domestic practice for the treatment of flatulency, and to promote exanthematous eruptions. It is also largely used as a dye by confectioners, cooks, and liquorists. In Oriental countries the Arabs like it in their rice because of its pleasing odor and the color thereby produced, and it is extensively used in coloring pastries

and sweets made for the native trade. The Hindus of Aden use it in religious practices to color their foreheads, the supplies for this purpose being mostly imported from India.—Pharm. Era, 52 (1919), 13.

Santolina Chamæcyparissus.—*As Adulterant of Chamomile.*—When the supply of German Chamomile was shut off because of the war there was considerable adulteration. The flowers of dog fennel, *Anthemis cotula*, and wild Roman chamomile, *Anthemis nobilis*, have both been found and both have been considerably discussed. J. F. Clevinger and C. O. Ewing have found *Santolina chamaecyparissus*, not hitherto reported as a drug adulterant. The shipment was invoiced as "chamomile flowers" and labeled "La Manzanilla Aroma" (Manzanilla is Spanish for chamomile.) The flowers of *Santolina chamaecyparissus* differ in several ways from *Matricaria*: they have a solid chaffy receptacle and that of *Matricaria* is hollow and without scales; ray florets are entirely absent and disk florets are much recurved. Little information about the chemistry of the flowers is available and that not well authenticated.—J. Am. Pharm. Assoc., 8 (1919), 538.
(Z. M. C.)

Scammony.—*Substitutes for.*—Under the above title, W. L. Scoville reports on the examination of a sample of *Resina drastica*, and which so closely resembled that known as Mexican scammony, *Ipomea orizabensis*, as to be easily mistaken for it.

The drug yielded 19.2 per cent. of a lemon-yellow resin, and which gave on examination results agreeing closely with that obtained with true scammony resin or Mexican scammony. The chief distinguishing features of the three resins are (1) the brownish color of true scammony resin and the very deep green color which it gives with iron salts, (2) the light color of Mexican scammony resin, producing a colorless alcoholic solution, and giving almost no color with iron salts, and (3) the deep lemon-yellow color of the *Resina drastica*.

The resin of *Resina drastica* is less soluble in ether and in chloroform than is true scammony resin or the Mexican scammony resin. It is more slowly soluble in alkalies than is the true or Mexican scammony resin. All three resins gave cloudy solutions in alkaline solution.—Jl. Ind. and Eng. Chem., 11 (1919), 335.
(L. A. B.)

Seaweed.—*Alcohol from.*—Kayser, working at the Pasteur Institute, Paris, and using *Laminaria digitata*, the common seaweed tangle, professes to have obtained on an average of no less than 6 qts. of alcohol from each 100 lbs. of seaweed and was of the opinion that the yield could be increased by using higher pressures during the manufacture. The plants were first submitted to a process of evaporation and reduced to 10 per cent. They were then placed in water containing 3 to 6 per cent. of sulphuric acid at about 60°. After being neutralized to 1 per cent. of acidity, the sugary liquid with nitrogenous material added in some cases was sprinkled with brewers' yeast. Fermentation quickly followed, especially where nitrogenous material was added and the alcohol was distilled from the mash.—J. Ind. Eng. Chem., 11 (1919) 368.

Seaweed.—*Food Value.*—During investigations as to the food value of seaweed Lapicque found that one species of *Laminaria*, if plunged into a weak lime bath and then washed for 15 minutes will produce an easily kept substance, 40 per cent. of which can be transformed into glucose. A large quantity of inexpensive forage can thus be produced.—Chem. and Drug., 91 (1919), 162.
(K. S. B.)

Senna.—*Adulteration of.*—On account of the scarcity of senna leaves in Germany a drug under the name of Palthé leaves has been imported into that country. P. Borisch reports that these leaves belong to *Cassia auriculata* and *Cassia holosericea*, that they do not contain oxymethylantraquinones and, therefore, have no laxative action. Borntraeger's reaction was carried out by boiling 500 mgms. of the leaves for two minutes with 10 mls of alcoholic caustic potash solution and adding 10 mls of water. The mixture is then filtered, the filtrate made acid with hydrochloric acid and shaken with 15 mls of benzene. On shaking the benzene solution with 5 mls of strong ammonia water, the latter is colored red when the drug consists of genuine senna leaves.—Pharm. Zentralh.; through Pharm. Weekblad, 56 (1919), 1449.
(H. E.)

Senna.—*Detecting Adulterations in.*—M. Joachimowitz finds that samples of senna leaves examined by him contained *S. palthé*, *S. obobata*, *Tephrosia apollinea* and other *Tephrosia* species. He

finds that the Wasicky reaction (rose-red color with hydrochloric acid) is not able to detect *S. palthé*, when it is present in amounts less than 5 per cent. and thinks that a better test is warming the sample with chloral hydrate, when a rose-red color is produced when *S. palthé* is present.—Z. Oesterr. Apoth. Ver.; through Chem. Abstracts, 13 (1919), 2966.

Shellac.—*Production by Insects.*—C. S. Misra says: Lac is a secretion produced by an insect that it sucks the juice of plants and transforms it into resin. This secretion hardens on exposure to the air into a deep red or orange-colored substance, semi-transparent, and breaking with a crystalline fracture. The insect belongs to a group commonly known as scale insects.

At the time of emergence the young insect is about one twenty-fifth of an inch in length and deep-red in color. After sluggishly wandering about and finding a suitable spot it fixes itself and then thrusts its beak into the tissues of the stem and begins sucking the juice. The sap thus taken into the body is greatly transformed and is given out uniformly through pores all over the body in the form of resin, which after a few days incases the insect completely. Female insects remain fixed once for all, but male insects emerge twice a year, sometimes as winged creatures.

The lac-bearing branches are cut off and placed on trees having a sufficient number of succulent branches. When the young insects have swarmed out the old lac-bearing branches are removed and the resinous incrustation (stick-lac) is scraped off with a knife, ground in a mill, soaked in water and washed. The pure animal resin (seed-lac) thus obtained is mixed with colophony and orpiment, cooked over a slow fire and drawn out into thin sheets, in which form it is commercially known as shellac.—Indian Agric. J.; through Pharm. Era, 52 (1919), 95.

Shellac.—*Substitute for.*—Shellac substitutes are produced from natural resin, water resin, or colophony, by a process patented by J. R. Kohler of Stockholm. The oxidized resin acid is extracted by first treating with ether, benzol, or oil of turpentine and then treating the residue with ethyl or methyl alcohol. The product is a shellac-like solution which may be used as a polish or converted into an insulating solid by evaporating the alcohol.—J. Ind. Eng. Chem., 11 (1919), 591.

Soy Beans.—*Celluloid Substitute from.*—A company has been formed in Japan to manufacture a substitute for celluloid from the albumen of soy beans.—Chem. and Drug., 91 (1919), 1388. (K. S. B.)

Spices.—*Grenada Production.*—The spices exported by Grenada during the year ended Sept. 30, 1917, totaled 402,079 lb. less than during the previous year.—Chem. and Drug., 91 (1919), 159. (K. S. B.)

Sphagnum Moss.—Dr. G. Heald gives several instances where old fashioned remedies and ideas suddenly through a little investigation and study became important modern agents. Such a more recent grandmother's remedy adopted by the profession is the use of sphagnum moss as a surgical dressing, said to be superior to cotton on several points.—Sanitarium Quarterly; through J. Am. Pharm. Assoc., 8 (1919), 163. (H. H. S.)

Sphagnum Moss.—*A Commercial Product.*—T. A. Church states that this product is now being offered on a commercial scale and that for some uses it promises to succeed cotton as an absorbent. Its use as a surgical dressing was first demonstrated in Germany about forty years ago. It was used in the Russo-Japanese War as a first aid dressing. In the course of botanical surveys of the Pacific States, large beds of this moss were found in Washington. The plant grows in marshy places, especially cranberry bogs. The most valuable species for dressings are *Sphagnum imbricatum*, *S. palustre* and *S. papillosum*. The product is usually hand picked and all foreign matter is shaken out. A factory has been established for the commercial exploitation of absorbent pads similar to those produced in war time.—Pharm. Era, 52 (1909), 253. (C. W. B.)

Sphagnum Peat.—*Use as Antiseptic Dressing.*—Peat produced by the decomposition of sphagnum moss is so antiseptic and absorbent that it may be used as a dressing for wounds, and is an excellent substitute for medicated cotton. This fact has been recognized for some time in Europe, where sphagnum moss is now extensively used in preparing surgical dressings. According to Prof. Soper, there are large tracts of sphagnum bog in the northern counties of Minnesota, Wisconsin and Michigan, also in Maine,

and some is found in New York and Pennsylvania. No deep excavation would be necessary, for immense quantities of sphagnum can be taken from the upper parts of the deposits.—Coal Age; through Pract. Drug., Apr., 1919, 34.

Storax.—*American.*—The oleoresin of *Liquidambar styracifolium* has been receiving attention during the past two or three years as a substitute for the oleoresin of *Liquidambar orientale* from Asia Minor. The war curtailed the supply of the Asiatic product into America, and the United States Forest Products Laboratory undertook some co-operative experiments to develop methods of gathering the so-called "sweet gum" or American Storax. To what extent the latter can compete with the Asiatic product under normal conditions is now being worked out. Analysis of an average sample from the laboratory of Fritsche Bros., Inc., New York, gave the following data; Incineration residue, traces only; purified balsam, 85 per cent.; saponification number of purified balsam, 179; acid number, 41. The tree producing American storax grows from Connecticut to Illinois, southward and southwestward into Mexico, but the exudation is collected only in the South. The balsam exudes in the form of a thick liquid, having the density of syrup and a yellowish color. On standing it thickens, becomes darker in color, and finally hard at ordinary temperature, and breaks with a resinous fracture, which is of a variegated appearance, the color being brown, with lighter spots and streaks.—Pharm. Era, 52 (1919), 313.

Storax.—*Resin Acids of.*—M. Henze thinks that Tschirch's storesinol is mostly abietic acid. He claims that a "pre-war" sample of 1913 examined by him contained 30 per cent. of abietic acid. Tschirch in replying states that even before the war, much storax was adulterated with coniferous balsams.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2733.

Stramonium.—*Influence of Stem and Roots on Alkaloidal Content.*—George P. Koch asks the question: Can the stems of stramonium be used with the leaves for commercial purposes? He then gives in detail some research work done in connection with this question which gives the answer in the affirmative. He says the importance of this matter is not due to any scarcity of leaves of stramonium but to the scarcity and cost of labor. If the stems

could be used the labor involved in harvesting a crop of stramonium would be one-fourth to one-fifth as much as where the leaves alone are harvested. He says if this could be done without any diminution of the alkaloidal requirements of the U. S. Pharmacopœia, perfected machinery for gathering the crop could easily be employed. The Pharmacopœia permits no more than 10 per cent. of stems of foreign material and a yield of 0.25 per cent. of the total alkaloids of the stramonium. Fifteen representative plants were taken from the field and used for this study. The data obtained brought about the following conclusions: Moisture content: Leaves 80 to 85 per cent., secondary stems 87 to 92 per cent., primary stems 85 to 87 per cent., and roots 78 to 82 per cent. The ratio of the leaf to the whole stem is as 47.5 to 52.5 when the whole plant without the root is considered. A consideration of the leaf, stem, and root showed the leaf represented 41 per cent. of the whole plant. The total alkaloids of the leaf and secondary stems analyzed individually or the leaves with 10 per cent. of secondary stems, give a content higher than required by the U. S. P. He says the whole plant with or without the root can be used without fear of the total alkaloidal content falling below the present standard.—Am. J. Pharm., 91 (1919), 11. (J. K. T.)

Strophanthus.—*Galenicals Made from.*—J. Blomberg, Jr., cites the confusion due to the three species of *Strophanthus* used in pharmacy. All three are used by African natives as arrow poisons owing to their heart action. The tincture should be made from seeds deprived of their (35 per cent.) fat. The sulphuric acid color test should be performed by diluting the tincture with 10 volumes of water and then testing at room temperature with 75 per cent. alcohol. The test can be used quantitatively as well as qualitatively. While the tincture is not diuretic, the aqueous extract of *Kombé* seeds is strongly so, containing as it does two saponins; one acid, the other neutral. The aqueous extract is worthy of thorough clinical study.—Pharm. Weekblad; through Chem. Abstracts, 13 (1919), 769.

Strophanthus.—*Quality of.*—E. M. Holmes states that it has been impossible to obtain pure *Strophanthus Kombé* in commerce and suggests that a specification be adopted whereby the seed be kept in the pericarp until used. It is practically impossible to distinguish seeds of *S. Courmantii* from those of *S. Kombé*.

The danger lies in the fact that it is impossible to fix accurate dosage for mixed lots of seed. In view of the limited range of *S. Kombé*, it might be well to order the use of *S. hispidus*, which is more easily obtained.—Pharm. J., 102 (1919), 33. (C. W. B.)

Strophanthus Seeds.—*Solvents for Active Principles of.*—A study of the seeds of *Strophanthus kombé*, by Karam Samaan, elucidated the following points:

1. Drying for four successive days of 8 hours each at 40 to 50° gives a loss of weight, considered as moisture, of 6.85 per cent.

2. The oil, amounting to 31.55 per cent. of the original seeds, obtained by extracting these dried seeds with dried petroleum ether, and the residue obtained by further extraction with ether, amounting to 0.415 per cent. of the original seeds, are both inactive. On shaking the oil with water and standing, a yellowish white, resinous solid body separated out. This body was soluble in chloroform, petroleum ether, ether and alcohol, but was precipitated out of the ether and alcohol solutions by a 1 per cent solution of hydrochloric acid.

3. The poisonous property of the seeds is due to a water soluble glucoside or glucosides, no active principle being extracted by any other solvent. Water is the best solvent for the active principle, completely extracting the seeds, while methyl alcohol is next best, with chloroform a very poor solvent. Neither alcohol nor amyl alcohol completely extracts the seeds, probably because of coagulation of the proteids, preventing thorough contact, although amyl alcohol completely removes the bitter principle from the aqueous residue.

4. The water-soluble principles slow the heart, prolong the period of systole, and are non-cumulative.

5. The toxicity of K-strophanthin prepared in the laboratory, and of strophanthin Merck are practically identical.

6. The best method of preparing the tincture is to moisten the defatted seeds with 65 per cent. alcohol and percolate in a long, narrow percolator until the seeds are free from bitterness.

The following test for strophanthin is given by the author of the paper: Two drops of concentrated sulphuric acid on a slab with 0.1 gramme of ammonium molybdate and a trace of strophanthin or strophanthin-containing residue gives a light brownish green color which gradually develops into blue after 10 minutes. The intensity of the blue color reaches a maximum in 20 minutes

and remains permanent, but may be destroyed instantaneously by a trace of concentrated nitric acid.—Chem. and Drug., 91 (1919), 802-3. (K. S. B.)

Strophanthus.—*Sulphuric Acid Reaction of.*—E. Gilg discusses in detail this important test. He states that it is all-important that the concentration of the acid should be 80 per cent. He points out that while *Strophanthus kombé* is colored green by the reaction, *S. eminii* becomes bright yellow, orange, bright red and then red. He considers that the course of the reaction with 80 per cent. acid runs: (a) primary yellow to orange for all species; (b) specific reaction, presumably of strophanthidin, colors differing according to species and varieties; (c) clearance reaction, presumably due to strophanthic acid, exhibiting different colors.—Ber. pharm. Ges.; through Chem. Abstracts, 13 (1919), 3272.

Sumach Galls.—*Use by Chippewa Indians.*—W. J. Riley calls attention to the fact that Chippewa Indians made use of galls produced by a species of *Eriophyes* on sumac, *Rhus copallina* and *R. glabra*, a fact that was overlooked by Miss Fagan in her paper on the uses of insect galls. These galls occur abundantly in Minnesota and are collected in late summer by the medicine men who use them in an infusion as a remedy for diarrhea and in poultice for the treatment of burns.—J. Econ. Entomol., 12 (1919), 217. (Bot. Abstracts.)

Symphytum Officinale.—*Presence of Allantoin in.*—Vogl obtained abundant monoclinic prisms of allantoin, when alcohol containing 20 per cent. of acetic acid was added to a section of *Symphytum officinale* and the evaporation of the alcohol prevented. Allantoin occurs in largest amounts from autumn to early spring reaching a minimum in the plant during summer. It was not found in other species examined, because as the author suspects, they are not examined at the favorable time.—Pharm. Post: through J. Chem. Soc. A., 116 (1919), 60. (A. V.)

Tobacco.—*Fumigation during Curing.*—Tobacco, harvested late in the season, cures badly owing to its comparatively large water content, which renders it prone to attack by fungi. As a result, the product when dry is very dark in color and of a poor quality in other respects. In order to guard against the invasion of fungi

and to insure a product of the desired color, E. Crouzel recommends that the leaves, during the process of curing, be subjected to the action of the fumes produced by burning a mixt. of chaff, hay and sulphur.—Rep. pharm.; through Chem. Abstracts, 13 (1919), 1894.

Tormentilla.—Brandt describes the structure of this root and suggests that it might be useful as a rhatany substitute.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1360.

Triticum.—*Bermuda Grass as Adulterant.*—As the rhizomes of *Cynodon dactylon* (*Capriola dactylon*) constitute the chief adulterant of *Triticum repens* (*Agopyrum repens*), James Small has examined the latter and gives the following brief description of the microscopic appearance of each with the object of rendering easy the detection of adulteration:

Triticum repens.—An outer ring of sclerenchyma three or four cells in width forming a hypodermis, and a broader ring forming a common sheath to the vascular bundles and completely enclosing the outer bundles. A few small bundles occur in the cortex, surrounded by a single row of sclerenchyma. In mature rhizomes, disintegration of some pith cells gives a hollow center.

Cynodon dactylon.—Around the outer part of the rhizome one ring of sclerenchyma forms a wavy band inside the cortex, which is narrower than in *Triticum repens*, and encloses no small vascular bundles. Many scattered bundles occur within the sclerenchyma ring, each with a bundle sheath of the same tissue one or two cells thick. The section is usually oval, with two lacunæ in the cortex at each end. All cells of the ground tissue within the sclerenchyma have comparatively thick walls, and are filled with starch, which gives a characteristic white appearance to the cut surface. The center is frequently, but not always hollow.—Chem. and Drug., 91 (1919), 806. (K. S. B.)

E. N. Gathercoal discusses the new adulterant. History indicates that both plants have been used since the time of Dioscorides and Galen. Botanically there is a wide difference in the two plants but pharmacognostically the distinctions are less marked. Histologically, the two rhizomes are very dissimilar. Chemical differences exist also. Neither is very active therapeutically

both probably being slightly diuretic.—J. Am. Pharm. Assoc., 8 (1919), 26. (Z. M. C.)

Although genuine triticum grows abundantly in many parts of American, when European triticum became scarce, Bermuda grass was offered as U. S. P. triticum. Bermuda grass, *Capriola Dactylon*, grows in northern Africa and southern Europe and is naturalized in America. C. J. Zufall describes this adulterant in detail and gives distinguishing features. It is usually hard and brittle and triticum is soft and pliable. It is not sweet to the taste like triticum

Fig. 28.

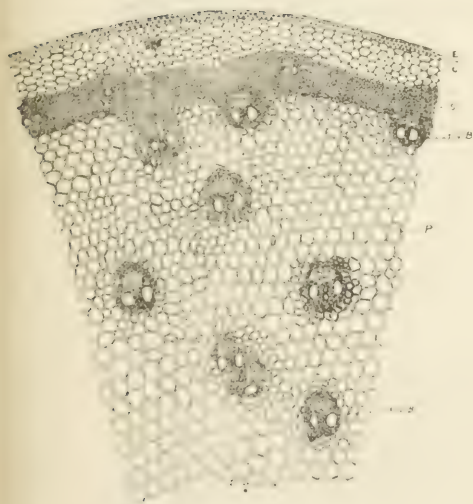
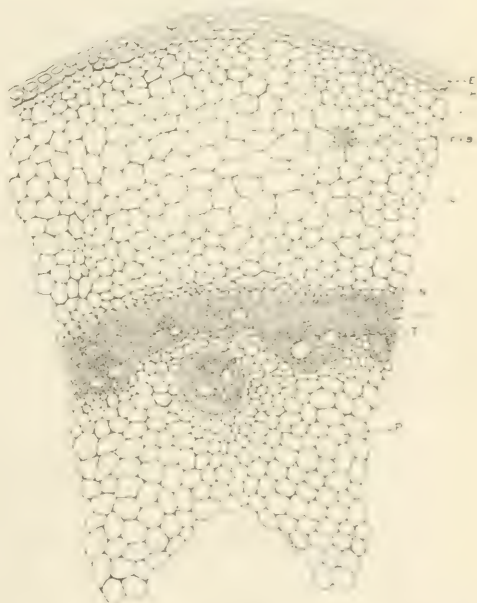


Fig. 29.



Agropyron Repens. Transverse section of rhizome: E, epidermis; H, hypodermis; C, cortex; S, sclerenchyma tissue; P, pith; FVB, fibro-vascular bundle.

Capriola Dactylon. Transverse section of rhizome: E, epidermis; H, hypodermis; FVB fibro-vascular bundle; C, cortex; N, endodermis; S, sclerenchyma tissue; T, trachea; P, pith.

and contains much starch. Under a lens transverse sections are quite different. The description and cuts (Figs. 28 and 29) should be of assistance in differentiating between the species.—J. Am. Pharm. Assoc., 8 (1919), 472. (Z. M. C.)

Triticum Repens.—*A Commercial Rarity.*—In a paper presented to the British Pharmaceutical Conference, Dr. James Small stated

that in an examination of the material being sold as *Triticum repens*, he found the true drug to be a commercial rarity, and the chief, if not the only, substitute is the rhizome of *Cynodon dactylon*, the dog grass. E. M. Holmes, discussing Dr. Small's paper, referred to the large demand for *Triticum repens* in America, and said that so far as England was concerned, couch grass was formerly imported from Germany. It grows best on heavy or stony soils, and, although cutting is easy with a chaff-cutting machine, it requires further winnowing to get a clean article. Handing round specimens, Mr. Holmes pointed out that the bract-like bodies on the leaves were a distinguishing feature. Those of *Triticum repens* were insignificant; those of the other plants were more developed, and were different from each other. After the rhizome had been winnowed it was difficult to tell one of the plants from the others. We ought to distinguish between them in nomenclature—Pharm. Era, 52 (1919), 241.

Turneraceæ.—M. G. Berger describes six genera of the family Turneraceæ can easily be distinguished from each other by their anatomic structure. The author believes that the Turneraceæ must be considered as a special family, but if taken away from the Bixaceæ, they should be counted to the family Passifloræ. The author further deals with the medicinal use of the members of this family, and especially of that of damiana (*Turnera aphrodisiaca*) and with the various substitutes offered for this drug.—Bull. Sci. Pharm., 26 (1919), 533; through Bot. Abstracts. (H. E.)

Umbelliferous Fruits.—*Anatomy of.*—Jos. Styger describes the macroscopic and microscopic characteristics of the fruits of *Angelica Archangelica*, *Ferula Narthex*, *Ferula galbaniflua*, *Ferula angulata*, *Pastinaca sativa*, *Heracleum Spondylium*, *Laserpitium Siler*, *Laserpitium marginatum*, *Opopanax chironeum*, and *Daucus Carota*. *Angelica Archangelica* is winged and its mesocarpis composed for the most part of loosely arranged, porous and reticulately thickened parenchyma with large intercellular-air-spaces; its vittæ are distributed above the inner epidermis and in the ribs. *Ferula Narthex* shows a band of thick-walled, punctated cells in the inner Mesocarp and giant vittæ in the mesocarp. *Ferula galbaniflua* is distinguished from *F. Narthex* by having vittæ in mesocarp and ribs; its outer epidermis and the cell layers lying directly beneath are strongly thickened but not woody, and hes-

peridin crystals exist in all the epidermal cell glands. *Pastinaca sativa* shows vittæ alongside vascular bundles, a sclerenchyma band in the inner mesocarp and finely punctated parenchyma in its winged ribs. *Heracleum Spondylium* has a sclerenchyma band in the inner mesocarp and finely punctated thick-walled parenchyma in the wings outside of the bundles. *Laserpitium marginatum* has elliptical vittæ while those of *L. Siler* are triangular, as viewed in cross section. *Opopanax chironeum* shows cells of epidermis, wings, and cells within vascular bundles with elliptical punctations; *Daucus Carota* has delicate spines growing from secondary ribs, and bristle-hairs only on primary ribs. The second paper presents an analytical key to the fruit mentioned above. These are placed in 3 main groups: (1) Without oil-containing elements. (2) With secretion sacs. (3) With oil reservoirs (vittæ). The first two of these captions have but one representative each, viz., *Conium maculatum* and *Hydrocotyle vulgaris* respectively. The third group includes two subdivisions: (a) With commissural vittæ only, (b) with dorsal and commissural vittæ. Further grouping of these subdivisions is based upon presence of one or more vittæ in mesocarp, sclerenchyma plates, hairs, strongly thickened and lignified parenchyma elements in mesocarp, secondary vittæ, and distribution of the vittæ in inter-rib and rib-regions.—Schweiz. Apoth. Ztg., 57 (1919), 199, 228 and 243; through Bot. Abstracts. (H. W. Y.)

Vanilla.—*Cultivation in Guadeloupe.*—With the exception of about 5000 pounds, Guadeloupe's entire vanilla crop (45,000 pounds) has been shipped to this country, according to a report just received by the Department of Commerce from the American vice-consul in the French West Indies.

The 5000 pounds retained has been prepared after the Mexican style, and the preparer declares that it is difficult for the eye to detect in what respect his vanilla differs from the Mexican, and asserts that he recently sold some of it at \$3.50 per pound to a wholesale house in New York. The claim is that Guadeloupe vanilla was grown from imported Mexican vanilla vines, that climatic conditions there do not differ much from those of Mexico and that his preparation, being Mexican, certainly should sell at Mexican prices. It will take time, however, it is declared, to establish such a market. The grower referred to will send a consignment of his Mexican preparation to France this month.

The prospects for a good vanilla crop in 1919 are declared to be excellent, with a promise of 50 per cent. more than in 1918.—Pharm. Era, 52 (1919), 255.

Vanilla.—*Mexican Output.*—The 1919 harvest of Mexican vanilla is estimated at 30,000 lbs., by R. Gomez, against 100,000 lbs. in 1918.—Chem. and Drug., 91 (1919), 1168. (K. S. B.)

Vegetable Wax.—*Japanese Exports.*—The Japanese exports of vegetable wax during the past three years were as follows: 1916, 6,308,295 kin; 1917, 4,976,093 kin; 1918, 8,924,049 kin.—Chem. and Drug., 91 (1919), 445. (K. S. B.)

Veratrum Album.—*Histology of Seed of.*—A. Tschirch presents an anatomical study of the seed of *Veratrum album*, showing that raphide cells are present only in immature seeds. Neither they nor starch are found in the ripe seed.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 55.

Viburnum Prunifolium.—*Of Little Value.*—None of the preparations of *Viburnum prunifolium* examined by Hager and Becht exerted any marked action on the uterine movements either in a positive or negative direction. As compared with pilocarpine and pituitary extract, viburnum is an indifferent drug, with no specific action on the uterus. No uniform pharmacological effect can be attributed to it. The changes in the contractions of the uterus, which sometimes occur on the addition of a fluidextract of *Viburnum prunifolium* bark, are so slight that they may be explained as being produced reflexly through manipulation of the animal during injection, or by the alcohol which holds the drug in solution.—J. Pharmacol.; through Pharm. J., 103 (1919), 64.

Vicia Ervilia.—*Toxicity of.*—Wilce and Tschumi examined a sample of feed that had poisoned a hog and found therein the grains of *Vicia ervilia*, or *black vetch*, which has been known as toxic since antiquity. The paper discusses the anatomical characteristics of this seed, the notable ones being halberd shaped air spaces in the epidermal cells and distinctive starch granules. The chemistry and pharmacology of the active principle is being investigated.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2971.

Violet Root.—*Constituents of.*—O. Linde discusses the chemistry and pharmacology of the roots of *Viola odorata* and *V. tricolor*, with special reference to Peters' investigation of the remedy, viola emetine Boullay, according to which this commercial product is nothing more than purified extracts containing very small quantities of alkaloids. While the roots of both *Viola* species just cited contain traces of alkaloids, their action is hardly due to their alkaloidal content.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2963.

Viscum Album.—*Hypotensive Principle of.*—G. Cusmano prepares a solution of the substances found in *Viscum* by dialyzing a decoction of fresh leaves with water. The hypotensive components pass through the membrane, and the solution thus obtained is concentrated on a water-bath and extracted with alcohol (96 per cent.). At first there is a formation of a homogeneous mixture, but on standing two strata are separated and the lower one is discarded. The supernatant liquid is again concentrated and again extracted with alcohol. As a guide for the separation of the hypotensive compounds the author used the method of injection in the blood stream of the dog.—Gaz. chim. Ital., 49 (1919), 225. (Bot. Abstracts.)

Yeast.—*Metabolin and Antibolin of.*—E. Vahlen has prepared metabolin and antibolin from yeast which, although not quite identical with the similar principles previously extracted by him from the pancreas of cattle, resembled them in their principal properties. Metabolin accelerates alcoholic fermentation, antibolin has the opposite effect. These principles can be transformed into each other by molecular rearrangement. An irreversible metabolin has also been prepared from yeast and potatoes. This metabolin also accelerated alcoholic fermentation and reduced the amount of sugar in the urine of diabetic patients on two occasions.—Z. physiol. Chem.; through J. Soc. Chem. Ind., 38 (1919), 922A.

Yeast.—*Nitrogenous Constituents of.*—J. Meisenheimer found in yeast, glycocoll, alanine, valine, leucine, proline, phenyl-alanine, aspartic acid, glutamic acid, tyrosine and tryptophane. Serine and cystine are possibly present, but could not be absolutely proven.—Z. Physiolog. Chem.; through J. pharm. chim., 20 (1919), 361.

Yeast.—*Uses of.*—Yeast is one of those remedies that have undergone alternating cycles of use and of disuse; just as present it appears again to be in its ascendancy. Recently renewed attention has been called to its laxative qualities. The much-debated question whether yeast can be used as a food, can be answered in the affirmative. However, in view of its laxative action, the amount of yeast which can be ingested is limited. Also, owing to its high nuclein content it is contraindicated in gout. As a source of water-soluble growth promoting as well as antineuritic vitamine, yeast has become thoroughly established. However, as common foods contain this vitamine, there is little likelihood of its proving of therapeutic value, since it promotes growth only when stunting is due to lack of vitamins. Yeast has been used as an application in acne, for infected wounds and leucorrhea. Recently the curative value of the oral administration of yeast in various cutaneous disorders has been reasserted.—*J. Am. Med. Assoc.*, 73 (1919), 628. (W. A. P.)

Yeast.—*Use in Beriberi.*—N. M. Saleeby studied a yeast extract prepared by the Philippine Bureau of Science, from brewers' yeast obtained in Manila, by incubating at 35° for forty-eight hours, then filtering and concentrating to one-third the volume in partial vacuum below 60°. About forty acute cases were treated. The dose for adults was 15 to 40 mils and children 2 to 4 mils. Marked results were noted in less than three days and full relief in a week. This extract seemed to behave much the same as hydrolyzed extract of rice polishings, only weaker.—*Philippine J. Sci.*, 14 (1919), 11. (Bot. Abstracts.)

Yohimbi Bark.—*Sources of.*—Besides *Corynantha Yohimbi*, the original source of yohimbi bark, the commercial bark is also obtained from *Pausinystalia Yohimbi*, *P. Trillesii*, and *P. macroceral*, the former and latter occurring in the Cameroons and all three near Libreville, in the French Congo. The first contains chiefly the active alkaloid yohimbine, the last the inactive alkaloid yohimbenine, and the other unknown proportions of each. In *Pausinystalis* species the corolla is more or less wheel or bell shaped, with included stamens and styles. The fruit dehisces septicidally. *Corynanthe* species have a funnel shaped corolla, with a slender tube as long as the lobes, and the stamens and styles project

beyond the corolla. The dehiscence of the fruit is loculicidal.

The bark of *P. Yohimbi* is thin, hard, slightly curved, 2 to 3 mm. thick, fibrous, and has a bitter, mucilaginous taste. That of *P. macroceral* is usually about 1 cm. thick, softer, more loosely fibrous, with a less bitter taste.—Chem. and Drug., 91 (1919), 1103. (K. S. B.)

C—ANIMAL DRUGS AND PRODUCTS

Animal Extracts.—*Inorganic Toxic Constituent.*—The alcoholic extracts of the tissues of seven species of animals were all found by N. R. Smith to be toxic when administered by injection. These extracts were all acid in reaction, with the occasional exception of extracts of stomach and intestines. Neutralization of the acid reaction did not affect the toxicity, and ether did not extract the toxic substances from the tissues. When the alcoholic extracts were incinerated, and the white ash was dissolved, the solution in the original volume of the extract was found to be toxic, in some cases more so than the extract from which it was obtained. Aqueous extracts were found to be more toxic, and to give a higher percentage of ash, than alcoholic extracts, and this increased toxicity was proportional to the increased ash content. The inorganic substance is in combination with the organic matter, since it cannot be removed by dialysis, as both organic and inorganic substances dialyze freely. Boiling does not affect the toxic substances, and it passes readily through a Berkefeld filter. Ultimately the toxic constituents were found to be pyrophosphate salts. These salts are actively toxic to the guinea-pig, and the symptoms following their intravenous injection are similar to those caused by a solution of organic extract ash given in the same way.—J. Lab. Clin. Med.; through Pharm. J., 103 (1919), 434.

Bee-Stings.—*Venom of.*—The phenomena noted in the poisoning by bee-stings indicate that the venom is a proteotoxin. Arthus found that its action resembles that of scorpion venom being at times considerably hypotensive. It differs, however, from the latter in that it does not produce sialagogue or mydriatic effects. With rabbits it has a marked action on the intestinal peristalsis.—J. pharm. chim.; through Drug. Circ., 63 (1919), 504.

Casein.—*From Human Milk.*—Bosworth and Giblin find that human casein contains 15.75 per cent. of nitrogen, 0.70 per cent. of phosphorus and 0.70 per cent. of sulphur. They find its molecular weight is 8,888.—J. Biol. Chem.; through Am. J. Pharm., 91 (1919), 120.

Casein.—*Preparation of Pure.*—Van Slyke and Baker prepare a casein free from inorganic phosphorus, calcium and hydrolytic products by introducing a mixture of 1 part of hydrochloric and 2 parts of acetic acid by means of a tube which terminates very closely to a mechanical stirrer operating at high speed near the bottom of the vessel containing the undiluted milk. By this method, the casein is prepared within 10 hours and the yield is practically quantitative.—J. Biol. Chem.; through Am. J. Pharm., 91 (1919), 120.

Cod Liver Oil.—*Newfoundland Exports.*—The exports of cod liver oil from Newfoundland during 1918 were 321,969 gals., compared with 26,218 gals. in 1914.—Chem. and Drug., 91 (1919), 967. (K. S. B.)

Cod Liver Oil.—*Norwegian Output.*—The following statistics concerning the Norwegian cod liver oil industry are given:

	1916	1917	1918	1919
Catch of cod (millions).....	51.4	27.7	24.4	30.2
Yield of c. l. o. (hect.).....	60,000	37,100	21,500	37,600
Yield of liver for "raw" oils (hect.).....	5,400	6,800	9,900	5,200

—Chem. and Drug., 91 (1919), 738. (K. S. B.)

Cod Liver Oil.—*Use of Newfoundland.*—The Imperial Institute has recently been investigating the medicinal value of cod liver oil from Newfoundland. Thirty tuberculosis patients in a London hospital were given this oil in place of the Norwegian product for a period of three weeks, with the result that no difference could be distinguished between the two oils. The results are considered to be very satisfactory, and there appears to be no reason why the Newfoundland oil should not find an increasing market in England. Excessive shipping rates have recently been a serious handicap; the freight per gallon was approximately

3s., compared with 6d. during 1914-7, and about 2d. in normal times.—J. Soc. Chem. Ind.; through Pharm. Era, 52 (1919), 175.

Egg Products.—*Manufacture in China.*—The process of manufacturing the principal egg products (whole egg powder, dried albumen, liquid yolk, and dried yolk) in China is briefly as follows: After thorough cleansing the eggs are broken, and for individual manufacture of albumen and yolk the two are separated. After two or three days of fermentation, during which time the clear liquid settles and is drawn off, the high acidity of the albumen is neutralized by the addition of ammonia. The drying is then done in shallow metal pans, coated with petrolatum, in rooms heated to a temperature of 140° F. The dried albumen is put up in tins of 100 pounds net each; these tins are packed two to the wooden box, which weighs 250 pounds gross and measures 7 cubic feet. Liquid egg yolk is run through a series of graduated sieves so constructed as to leave the final product in practically liquid form which is treated with either a 2 per cent. solution of boric acid or a 1 per cent. boric acid and 9 per cent. salt solution, or sometimes a straight 12 per cent. salt solution, after which the yolk is mixed in wooden drums for 15 minutes. It is shipped in barrels weighing 500 pounds gross and 430 pounds net and measuring 12 to 14 cubic feet. Some factories guarantee the yolk to keep four months from the date of shipment. Dried yolk contains no chemicals and is manufactured by vacuum machines, about 51 yolks being required to a pound of powder.—Pharm. Era, 52 (1919), 43.

Fur Seal.—*Possibility of Medicinal Substances from.*—Various organs of the fur seal are to be examined to demonstrate the presence or absence of constituents of therapeutic value. The pituitary, pineal, adrenal, pancreatic, and other glands are to receive attention.—Chem. and Drug., 91 (1919), 841. (K. S. B.)

Glands.—*Influence upon Racial Appearance.*—Arthur Keith advances the theory that the glands of the body may have a bearing upon the characteristics of the racial types into which mankind is divided. He thinks the thyroid gland may, through its influence upon the skull, account for the facial characteristics of the Mongolian race, and believes that the pituitary is especially con-

cerned in the differentiation of the European or Caucasian. He suggests that the interstitial glands may have been concerned in the production of the robust manifestations of the male characters found conspicuously in the Caucasian type. These glands might also be the cause of the beardless face and almost hairless bodies of the Negro and Mongolian, these characteristics being associated with the degeneration or removal of the interstitial glands.—Chem. and Drug., 91 (1919), 1067-8. (K. S. B.)

Honey.—*Manitoban Production.*—During 1918 approximately 100,000 lbs. of honey was produced by Manitoba.—Chem. and Drug., 91 (1919), 86. (K. S. B.)

"Mexican Cantharides."—T. E. Wallis states that certain poultry spices and foods contain insects, either whole or powdered, which have been identified as consisting mainly of species of *Notonecta* and *Corixa* coming from Mexico. These insects form a regular article of commerce, and have also been sold under the name of "Mexican Cantharides." Photographs, drawings, and descriptions of the insects were given to enable the analyst to identify them whole or broken.—Chem. and Drug., 91 (1919), 601.

Milk.—*Lactose Assay of.*—J. L. Mayer in a paper read before the New York State Pharmaceutical Association describes the determination of milk sugar in milk by clarifying the latter with acetic acid and alumina cream and treating the clear liquid in accordance with a modification of the Benedict method as described by the author in a paper printed in 1914 (YEAR BOOK, 1914, 641). Comparative tests were made using the Deffen-O'Sullivan method. The results show that the modified Benedict method while rapid and easily applied is capable of yielding accurate results.—J. Am. Pharm. Assoc., 8 (1919), 531. (H. H. S.)

Milk.—*Lactose Assay of Samples Preserved with Dichromate.*—Pierre Defranc has already shown that when milk preserved with potassium dichromate is analyzed, after a month to six weeks the total quantity of albuminoids remains unaltered, while the amount of true casein shows a very decided decrease. They now propose to investigate the nature of the decomposition products to ascertain whether they are optically active and levorotatory. It would also be interesting to determine the total albuminoids and

the true casein in milk heated with or without sodium bicarbonate, and to see if there is in this case any diminution in the amount of true casein, and the author intends to investigate this question.—Ann. Falsif.; through Chem. News, 119 (1919), 11.

Milk.—*Peroxydases of.*—H. Violle states that the presence or absence of peroxydases in milk affords no criterion of its quality. Good milk is frequently deficient in peroxydases, whereas milk from sick mothers usually shows large amounts of peroxydases. While it may be true that raw milk contains peroxydases and pasteurized milk none, there is no reason why the deficiency in the latter may not be supplied by interested parties by addition of juices containing peroxydases.—Compt. rend.; through J. pharm. chim., 20 (1919), 267.

Milk.—*Potential Acidity of.*—In investigating the effects of adding various alkalies to cows' milk, R. W. Terry found that the acidity of milk is not proportionately reduced by adding water. For instance, 15 mls of milk were neutralized by 2.6 mls of N/10 sodium hydroxide but 15 mls of milk and 15 mls of water required only 2.3 mls of N/10 sodium hydroxide. That the phenomenon is not an optical one he demonstrated by several tests. Further experimentation led to the following conclusions. Phenolphthalein is the only useful indicator; titrations with normal and tenth-normal solutions give different results; titrations with N/10 sodium hydroxide and N/10 calcium hydroxide do not give the same results; back titration gives higher results than direct titration; sodium citrate added to milk decreases its acidity; sodium oxalate also decreases acidity and a completely oxalated milk does not show the phenomenon observed in milk alone, indicating that it is due to calcium salts directly or indirectly. Mr. Terry shows the results of his work by tables and charts. One of the charts shows neutralization curves for different alkalies at different dilutions, the object being to furnish acidity factors for diluting milk feeding formulas, for which they are sufficiently accurate. The personal equation is so large a factor that the average of three or four closely agreeing results had to be taken. A chart is given also for calculating correct acidity of diluted milk mixtures by use of different alkalies. After performing many eliminative experiments, Mr. Terry concluded that this variation in acidity of milk and its dilution is due to freshly precipitated $\text{Ca}_3(\text{PO}_4)_2$, or

a mixture of it and CaHPO_4 . The precipitate comes down during titration and is soluble enough to immediately saturate the fluid, especially in the presence of citrates. Hydrolysis takes place and the greater the volume of liquid the greater will be the hydrolysis explaining the earlier appearance of the end-point in diluted solutions. Still other tests only verify this conclusion. It is evident that the result in any milk acidity determination is dependent on conditions that make comparisons next to impossible.

Mr. Terry believes that precipitating calcium salts with potassium oxalate before titration, as suggested by Van Slyke and Bosworth, is not the proper procedure because it does not give actual titratable acidity. Cows' milk has six times the potential acidity of human milk and adding alkali to cows' milk in infant feeding has a scientific as well as a practical basis. Mr. Terry goes carefully into the results of titrations of $\text{Ca}(\text{H}_2\text{PO}_4)_2$ with N/10 NaOH, with N/10 $\text{Ca}(\text{OH})_2$ and an oxalated $\text{Ca}(\text{H}_2\text{PO}_4)_2$ with N/10 NaOH and shows that the theoretical figures are close to the actual and that his conclusions, already cited, explain discrepancies. Equations for all of these reactions are given as well as equations showing the effects of citrates. In advising against adding lime water to cows' milk, Clark based his deductions on electrometric measurements of hydrogen-ion concentration of cows' milk, human milk and cows' milk with lime water but though hydrogen-ion concentration may affect the velocity of conversion of caseinogen to paracasein it has little to do with conversion of paracasein to calcium paracaseinate. This change is controlled by potential calcium ionization and that in turn by potential acidity. The physical condition of calcium paracaseinate depends upon its rate of formation, the more rapidly it is formed the more indigestible it is. If potential acidity is reduced the curd will be soft, flocculent and digestible like the curd of human milk. In conclusion, Mr. Terry gives the following method for determining milk acidity: "Pipette 10 mls of milk into an Erlenmeyer flask of about 100 mls total capacity and add 5 drops of a 1 per cent. alcoholic solution of phenolphthalein. Titrate slowly to the first noticeable pink tint that is permanent for one minute. This is to be determined by comparing with a flask of the same shape and capacity and containing the same amount of milk; N/10 sodium hydroxide V. S. is to be used in the titration. One mil of N/10 sodium hydroxide represents 10 degrees of acidity. The titration is to be performed only in daylight. No water should be added

before or during the titration." Mr. Terry explains why each step is as indicated and why it is necessary to comply with each detail.—J. Am. Pharm. Assoc., 8 (1919), 538. (Z. M. C.)

Milk.—*Test for Sucrose in.*—A modification of Gayaux's test for sucrose in milk suggested by G. D. Elsdon consists in treating 15 mls of milk with 1 ml of 3 N hydrochloric acid and 0.5 gramme of resorcinol. On drying five drops of the resulting mixture on a white tile on the water-bath, a red coloration is obtained in the presence of as little as 0.02 per cent. of sucrose.—The Analyst; through Chem. and Drug., 91 (1919), 15.

Condensed Milk.—*Assay of Lactose in.*—Condensed milk frequently contains inverted lactose. Hildt, therefore, recommends determining the lactose with Fehling's solution, both before and after inversion, and calculating the unchanged lactose by difference. For inverting lactose, heating with phenol or benzene-sulphonic acid for three to four hours at 100° C. is recommended. When milk is evaporated to dryness a change of the lactose takes place, probably due to a solution of the sugar with the albuminoids.—Compt. rend.; through Drug. Circ., 63 (1919), 382.

Condensed Milk.—*Use at Soda Fountains.*—A. B. Nichols relates his experiences with evaporated or condensed milks as substitutes for milk and cream in soda fountain beverages. He also reports satisfactory results in the use of dry milk (powder form) as an emulsifying agent. Using standard formulas but replacing acacia and other emulsifying agents, weight for weight, with dry milk, fine results were obtained both by the English and Continental methods. Finished emulsions were of a creamy consistence, white and held up exceedingly well.—Proc. Penna. Pharm. Assoc., 42 (1919), 162. (R. P. F.)

Milk Substitute.—*German.*—One thing that the war has brought very much into prominence is the preparation of "substitutes." Germany in particular has specialized in this direction. A substitute for milk appears to have been the following: 250 grammes of ground sweet almonds to a liter of water. From the physical, chemical, and alimentary point of view, it approaches very nearly cows' milk. No difference can be perceived when used with tea or coffee. The most suitable after sweet almonds are Brazilian

nuts. The following fruits can also be employed, but are not so suitable: Soya beans, earth nuts, walnuts, cocoanuts, hazelnuts, and acajou nuts.—Chem. News, 118 (1199), 177.

Musk.—*Its Origin and Export.*—China is the chief exporter of this product. The animal is trapped and, although hunting is carried on at all seasons, the autumn and winter musk is considered best. Upon being received at trading stations the pods are trimmed and packed in small wooden boxes. Adulteration is the general rule, peas, barley, acorns, fried liver and pulverized beef being used as adulterants. Testing is largely a matter of experience and involves appearance, smell and taste of the product.—Pharm. J., 103 (1919), 285. (C. W. B.)

Ovarian Extracts.—*Pharmacology of.*—Matsumoto and Macht investigated the action of the fresh and dried extracts on the urogenital organs. Corpus luteum extracts have very little action on the contractions and tonicity of the excised bladder or ureters. They exert a very stimulating action on the excised uterus and Fallopian tubes; but this action is not specific, since the same effect is produced by the extracts of all kinds of glands. Corpus luteum extracts exhibit a strong stimulating action on excised vas deferens and seminal vesicles, which is specific, since it causes reaction in these organs in doses entirely inadequate to stimulate other forms of smooth muscle. Also the same organs are not stimulated by very much larger doses of extracts of other glands. Ovarian extracts have a much weaker action than corpus luteum extracts. The vas deferens of the rat reacts with special intensity to corpus luteum extract, the reaction being proportional in intensity to the dose of the drug used. This isolated organ of the rat, therefore, affords a satisfactory means of assaying the activity of the corpus luteum extracts, and the various chemical derivatives thereof.—J. Urology; through Pharm. J., 103 (1919), 402.

Pituitary Extract.—*Standardization of.*—R. A. Spaeth finds as convenient test animal, the common minnow of the Atlantic Coast, *Fundulus heteroclitus*.—J. Pharmacol.; through Chem. Abstracts, 13 (1919), 59.

Silk.—*Distinguishing Natural from Artificial.*—According to Formhals when a small amount of the sample is treated for a short

time with a few mils of concentrated sulphuric acid and the mixture diluted with water and rendered alkaline with sodium hydroxide solution, the addition of diazo-*p*-nitrobenzene produces a red color in the solution when natural silk is present, while with artificial silk a yellow color is produced. The test can be applied to weighted and dyed silks.—Chem. Ztg.; through Drug. Circ., 63 (1919), 552.

Shrimp and Starfish Meal.—Shrimps in the fresh state are used as feed for poultry, etc., and in the dry state, being cheaper than meat or fish, are used as food. C. J. Kole reports on the analysis of fresh whole shrimps, fresh flesh and fresh shells, and found these to contain albumin 14.9, 20.8 and 13.5 per cent., respectively; fat 1.8, 1.4 and 2.2 per cent.; moisture 77.5, 75.6 and 73.8 per cent.; ash 4.7, 2.5 and 8.9 per cent. In the dried state the whole shrimp contained 66.0 per cent. of albumin, 8.1 per cent. of fat and 20.7 per cent. of ash. The respective figures for dried flesh were 85.2 per cent., 5.7 per cent. and 10 per cent., and for dried shells 51.6 per cent., 8.5 per cent. and 33.8 per cent. Commercial shrimp meal was found to contain 50 to 62 per cent. of albumin, 4.3 to 9 per cent. of fat and 21 to 35 per cent. of ash. The variations are due to the adulteration of shrimp meal with star fish meal, crab meal and similar substances. An addition of starfish meal can easily be detected microscopically. Starfish meal was found to contain 31.6 per cent. of albumin, 6.9 per cent. of fat, 12.1 per cent. of moisture, 43.9 per cent. of ash and 3.9 per cent. of sand. The high percentage of ash is due to the fact that 44 per cent. of the starfish consists of skeleton.—Pharm. Weekblad, 56 (1919), 346. (H. E.)

Snake Venoms.—*Action on Carbohydrates, Fats and Milk.*—Houssay and Negrete examined the venoms from 7 species of *Lachesis*, 2 of *Crotalus*, and 2 of *Ancistrodon*. The poison gland is not related to the salivary gland. The venoms do not hydrolyze starch, phlorhizin or sucrose, and with the exception of that from *Elaps maregravi*, they are not lipolytic, but all hydrolyze lecithin, and this hydrolysis is favored by calcium salts and by normal serum. The lecithinases show varying degrees of thermolability. The clotting action on milk was studied more fully; it is slow, and the requisite venom concentration varies from 1 : 4,000 to 1 : 200,000. Calcium, barium, magnesium, strontium and manganese, weak

acids, and (to some extent) chlorides favor the action; oxalates, citrates, fluorides inhibit it completely; phosphates and sulphates are partially inhibitive. Filtration, heating to 70° and shaking with charcoal destroy the rennet-like action, which is also inhibited by anti-ophidic sera, without complete specificity.—Pharm. Era, 52 (1919), 14.

INORGANIC CHEMISTRY

A—GENERAL SUBJECTS

ATOMS AND MOLECULES.

Allotropy, Allotropes and Allotropoids.—*Theory of.*—M. Copis-carow defines allotropy as the capacity of an element to exist in forms differing in the mode of their intramolecular linkage. Molecular forms differing in the number of atoms or distribution of linkage, but belonging to the same type of mode of linkage are termed allotropoids. The latter differ among themselves less than allotropes of the same element.—Chem. News, 118 (1919), 265. (J. H.)

Atom Structure and Chemical Affinity.—F. H. Loring presents a more or less speculative analysis of the problem of "chemical affinity," to a very excellent and condensed review of the work done on the electronic structure of the atom, from the experimental as well as from the theoretical side, and adds some theories of his own. Many very valuable bibliographic references are given.—Chem. News, 118 (1919), 145. (J. H.)

Atoms, Electrons and Valence.—J. C. Thomlinson discusses the relation between atomic weight, valence, atomic heat and gas volumes. Taking the increase of atomic weight as affecting valence in the periods of the Mendelijeff series and the group relationship as to weight, he concludes that atomic volumes introduce the conception of space.—Chem. News, 118 (1919), 180.

Atomic Weights.—*Mathematical Proof that They Are Integers.*—H. Collins attempts to show by probability calculations that the atomic weights are integers when $0 = 16$. He also contends that there are large errors in the higher atomic weights, and that

the ratio of $16 = 1.008$ must contain an unknown source of error.—Chem. News, 119 (1919), 247. (C. P. W.)

Electrons.—*Arrangement in Atoms and Molecules.*—Irving Langmuir calls attention to the fact that the problem of the structure of atoms has been attacked mainly by physicists, who have given little consideration to the chemical properties which must ultimately be explained by a theory of atomic structure.

The vast store of knowledge of chemical properties and relationships, such as is summarized by the Periodic Table, should serve as a better foundation for a theory of atomic structure than the relatively meager experimental data along purely physical lines. Kossel and Lewis having had marked success in attacking the problem this way, the present paper aims to develop and somewhat modify these theories.—J. Am. Chem. Soc., 41 (1919), 868. (J. L. M.)

Element.—*The Conception of, Based upon the Study of Radio-Active Change.*—A lecture by F. Soddy reviewing the progress made during the past fifteen years on the ultimate constitution of matter.—Chem. News, 118 (1919), 85, 97, 109. (J. H.)

Ether and Matter.—In a lecture on this subject at the Royal Institution, London, Sir Oliver Lodge, having described the classical experiments made for the purpose of measuring the speed and direction of the motion of the earth and the solar system through the ether of space, admitted that the results were entirely negative, and according to the Relativity theory, which was at present complicating physics, such measurement was impossible, because the measuring instruments used altered their dimensions along the direction of motion or across it. This theory would soon be put to a crucial test, because its exponents predicted that a ray of light from a star grazing the sun would be deflected one and three-quarters of a second of an arc, a prediction which would become the subject of observation at the solar eclipse visible in Brazil next May. His own expectation was that if there were any deflection at all it would not exceed three-quarters of a second, and that even if it occurred it would merely prove that a ray of light had weight. Discussing the constitution of the atom in the light of recent research, the lecturer explained that, according to the

now generally accepted view, the atom consisted of a nucleus of positive electrons, with one or more negative electrons revolving in orbits around it. Each atom contained the same number of positive and negative electrons, from 1 in the case of hydrogen to 92 in the case of uranium. For each of the intermediate numbers a distinct element might be inferred, and in actual fact there were at present only four gaps in the series. The analogies between the constitution and configuration of an atom and of the solar system were curious and suggestive, extending as they did not only to general structure, but to many other physical characters of the respective systems. So that in a sense they might speak of an astronomy of the stars and an astronomy of the atom. Wide vistas of new knowledge and discovery were opening before them, and it was the part of the wise man to keep an open mind for the reception of new truth.—*Pharm. J.*, 102 (1919), 230.

Isomorphism, Isosterism and Covalence.—Irving Langmuir in recent papers has described a theory of valence which he has called the octet theory. This theory is based of the "cubical atom." The present paper is a lengthy one which must be consulted in the original by those interested.—*J. Am. Chem. Soc.*, 41 (1919), 1543. (J. L. M.)

"Physical" and "Chemical" Forces.—P. V. Wells considers the classification between physics and chemistry as too artificial for present-day use. He proposes the following terms: molar, molecular, atomic, and electronic. Molar forces are those which maintain two or more masses in equilibrium as a single system; molecular forces maintain two or more molecules in equilibrium in a single system; atomic forces maintain two or more atoms in equilibrium in a single system; electronic forces maintain the negative or valence electrons and the positive nucleus in equilibrium in a single system. From the above are derived the terms molics, moleculics, atomics, and electronics.—*Chem. News*, 118 (1919), 76. (J. H.)

Quantum Theory.—Professor J. H. Jeans gave a lecture on *The Quantum Theory and New Theories of Atomic Structure*, in which he developed the modern conceptions of the atom, showing the immense strides that have been made of recent years. The ultimate constituents of the atom are electrically charged particles, and we know more of the negatively charged particles than we do

of the positively charged ones. The former are standardized; they may be now a part of chlorine, then be free; they are fundamental and interchangeable. The atom may be regarded as consisting of a positively charged nucleus, surrounded by negatively charged particles moving around the positive nucleus, by comparison the positive nucleus is enormous, and the negative electrons are in proportion mere dots, moving in an orbit at a comparatively enormous distance from the nucleus. The number of negative electrons present is equal to half the atomic weight of the element, which may be expressed as the "atomic number" of the element (*e. g.*, Argon = 19, Potassium = 20). The hydrogen atom thus consists of a positively charged nucleus, and one negatively charged electron moving round it. Radioactive bodies on disintegrating emit alpha-rays which are positively charged, and always amount to double the amount of negatively charged rays. Thus, the helium atom consists of one alpha-particle and two, in comparison, minute negative particles. The spectrum is a means of elucidating the laws governing the motion of the negative particles in relation to the positive nucleus in each system. If the atom moves by the Newtonian law, then it gives a continuous spectrum, moving towards violet. The laws of motion of the electrons have been studied by the distribution of energy observed in the discontinuous spectrum. Professor Jeans also alluded to the fundamental law of motion in the atom, as advanced by Planck, and to the mechanism of radiation. A change of orbit of the negative electrons gives out energy, and that is radiation, and radiation travels through ether in bundles. It is interesting to note that the conclusions arrived at in this respect by theoretical considerations, and by mathematical methods, were subsequently proved by experiments. In conclusion, Professor Jeans pointed out that when more electrons have been dealt with and more is known about them, this knowledge will open chemistry to the mathematician, and will explain valency, etc. Then chemistry will progress at a terrific rate when the chemist and the mathematician join forces.—*Chem. and Drug.*, 91 (1919), 457.

Structure Symbols.—*A System of.*—I. W. D. Hackh proposes a "shorthand" system for writing structural organic formula. After explaining the key, the structural formulas for the sixteen isomeric hexoses are given in a space of about one-half of a column

instead of taking up more than a page if the present method were used.—Chem. News, 118 (1919), 289. (J. H.)

PHYSICAL CHEMISTRY.

Adsorbents.—*Use and Valuation of.*—I. M. Kolthoff, in an exhaustive report on experiments made in regard to the adsorbent properties of both organic and inorganic substances towards chemicals, aniline dyes, bacteria, etc., says that Merck's blood charcoal has the greatest adsorptive power of all the products examined. Other charcoals are of considerably less value as adsorbents and graphite, linden charcoal, lamp black, etc., do not adsorb at all. For the details of the experiments the original should be consulted. In general it was found that positively charged substances are inclined to combine with negatively charged bodies and vice versa, but there are quite a number of exceptions to this rule. Merck's blood charcoal, being an excellent adsorbent for bacteria, is recommended for internal use, because a much smaller amount of charcoal is used to obtain a result equal to that of bolus. The objections made against charcoal as internal remedy that it adsorbs the enzymes of the stomach and the intestines and the hydrochloric acid in the stomach and thus impairs the appetite, are not valid, because Strauss ("Deutsch. med. Wochensch.," 42 (1915), 36) has shown that the small amount of pepsin and stomach juice which are adsorbed are readily replaced by increased secretion. The author further points out that quite a number of types of charcoal on the market lack sufficient adsorbent power. To establish the value of a charcoal for internal use it should be examined according to Wiechowski's methylene blue test or by its iodine adsorbing power.—Pharm. Weekblad, 56 (1919), 207, 237. (H. E.)

Crystallography.—*Applied.*—H. Leffmann discusses this topic and points out that a more extended application of the microscopic study of crystals, with the view to the solution of analytical problems, has been inaugurated and that in the course of a few years a vast amount of data of the most valuable type will be at hand. The U. S. Bureau of Chemistry is especially commended for its researches along this line. Specific instances of the application of

crystallography, to detect unusual features of certain plant sugars, which were proving fatal to bees, are recorded by the author. Another instance of the use of the methods was in determining the reason for the differences in color in a new high explosive which the War Department was using. It was found that the differences were due to inclusions in the crystals.—*Am. J. Pharm.*, 91 (1919), 615. (I. G.)

Distillation.—*Theory as Applied to Dilute Organic Solutions.*—J. Reilly and W. J. Hickinbottom discuss in a general way the theory of distillation of dilute solution. Experimental evidence at present available shows that for isomeric substances the distillation constants are distinct enough to differentiate between the substances. A relationship between molecular complexity and the distillation constants has been shown in the case of the lower saturated monohydric alcohol phenols. The possibility of using the distillation constants for differentiating butter fats from others is mentioned along with other data.—*Chem. News*, 119 (1919), 185. (C. P. W.)

Electrolytic Dissociation.—A review of the present position of the theory of ionization by S. Arrhenius.—*Chem. News*, 118 (1919), 61. (J. H.)

Elements.—*Melting Points of.*—This is the subject of Circular 35, U. S. Bureau of Standards. The interested reader should refer to it or to a comprehensive abstract found in *Chem. News*, 118 (1919), 129.

Temperature.—*Effect on Precipitation.*—George G. King describes a series of experiments carried out to determine the dependence of the time of precipitation upon the temperature of the liquid. He uses water as the liquid and rouge as the solid. The apparatus used was essentially the same as that described in Holley and Ladd's book on paints. The author finds that the time required for a precipitate to settle increases as the density of the water and that the density of the water is inversely to the temperature. The time, necessarily, is inversely to the temperature.—*Drug. Circ.*, 63 (1919), 486. (C. P. W.)

Refractometry.—*Applications in Technical Analysis.*—At a meeting of the London Section of the Society of Chemical Industry, A. R. Ling discussed this topic. He referred to the use of the refractometer for determining the solids present in a solution, as this method often yields results which are closer to the truth than those afforded by taking the specific gravity of a solution, particularly when the effect of varying amounts of dissolved solids in a solution on the specific gravity is taken into consideration, whereas the refractometer often detects such variations; however, the great drawback is that the latter method is less delicate. Among the many suggestions and practical experiences dealing with the varied applications of refractometry brought forward, allusion was made to the inclusion of refractometric tests for volatile oils in the British Pharmacopœia, but in this connection it was suggested that a temperature of 20° would be better suited to actual conditions than the prescribed temperature of 25° , and for fatty oils 40° was suggested as the optimum for carrying out tests. The value of the refractometer in the fractional distillation of volatile oils was also mentioned. The suggestion of lowering the temperature at which volatile oils should be tested from 25° to 20° was opposed, however, in view of its impracticability in warm countries, where these oils are obtained, and where a temperature of 40° was advocated. The chairman then alluded to the interest evinced in this discussion, thus illustrating the value of opportunities of this nature when physicists and chemists were able to exchange views and formulate their specific demands and limitations. The formation of a committee to study the question of a standard temperature for refractometric tests was advanced.—Chem. and Drug., 91 (1919), 230.

Thermodynamics.—*Second Law of.*—F. G. Edwards calculates the mass of an atom of the ether (a tetrahedron) as $\frac{1}{4}$ that of the hydrogen molecule $3.2 \times 10^{-24} = 0.8 \times 10^{-24}$ gramme—and deduces that even though atomic ether has density and pressure it need not have temperature.—Chem. News, 118 (1919), 183. (J. H.)

COLLOIDAL CHEMISTRY.

Colloidal Preparations.—Dr. E. P. Wightman reviews the history and development of the use of colloidal preparations. He

mentions among those metals made into colloidal preparations and used in medical practice: platinum, gold, silver, copper and mercury; non-metals, sulphur and iodine; compounds, iron hydroxide and copper hydroxide; alkaloids, cocaine and quinine. The methods and therapeutic uses are discussed.—Bull. Pharm., 33 (1919), 338. (C. M. S.)

Colloids.—*Investigation of.*—The report of a committee appointed by the British Association for the Advancement of Science contains some interesting information concerning colloids. It is said that rennet can coagulate 400,000 times its weight of caseine in milk. It acts best at 41° , and is rendered inactive by shaking, long storage, alkalies, or a temperature in excess of 60° . The loss of action upon heated milk, caused by the precipitation of calcium, is restored upon the addition of calcium chloride. The use of gelatin in the manufacture of ice cream gives a firm, rich product with a velvety texture, while tragacanth gives a softer cream, and starch a grainy inferior grade. In supplying the element in which the body is deficient, colloidal solutions give better results than equal strength solutions of the crystalline form of the substance, and may often be used in greater concentration than the crystalline form without deleterious results. The stability of colloidal solutions depends more upon the preparation than upon the presence of stabilizing agents. Dried hydrosols which are intended to form colloidal solutions on being added to water are not always satisfactory. Colloidal manganese is particularly indicated in the treatment of staphylococcal infection, such as boils; colloidal silver has now largely replaced silver nitrate in ophthalmology, its use being free from pain and its action more direct; colloidal mercury has cured persistently relapsing malaria in a few days; colloidal iron increases the amount of protein compound in the blood serum; hypodermic injections of colloidal palladium oxide into the fatty areas has relieved obesity; and colloidal iodine oil applied to bad chilblains causes all trace of the condition to disappear in four days.—Chem. and Drug., 91 (1919), 543. (K. S. B.)

ANALYTICAL CHEMISTRY.

Arsenous Oxide.—*Use as a Standard Substance in Iodimetry.*—Robert M. Chapin, in view of the development of a reliable method for the preparation of pure arsenous oxide, conducted an investi-

gation to determine the accuracy possible when this substance is employed in iodimetry.

The work involved the direct comparison by titration with weight burettes, of known amounts of pure arsenous oxide and pure iodine. The object was to establish the reliability of properly purified arsenous oxide as a standard to replace the less convenient iodine which has been the final recourse in work calling for the highest possible degree of accuracy. This substance is the simple oxide of an element of very accurately determined atomic weight; it is non-hygroscopic, permanent in the solid state and also highly permanent in a properly acidified solution.

In the ordinary titration of arsenous oxide with iodine, sodium bicarbonate is the buffer usually employed to maintain neutrality and is entirely appropriate for the purpose. For the reverse titration here contemplated it presented obvious defects. The sodium phosphate mixture advocated by Washburn appears to react with inconvenience. A borax acid mixture was also stated by Washburn to be theoretically applicable but was not regarded by him as practically as useful as phosphated bicarbonate. Barnbey found such a mixture useful in "differential iodometry." It effects a rapid reaction and is otherwise entirely convenient. Chapin's experiments show that the best buffer solution is one containing 8 per cent. of crystallized borax and 4 per cent. of boric acid. He also gives precautions for the preparation and use of standard iodine solutions.

It was found the evidence is in favor of arsenous oxide as the more reliable substance in practice.—J. Am. Chem. Soc., 41 (1919), 351. (J. L. M.)

Chemical Analysis.—*New Method of.*—A. W. Hull calls attention to the fact that two methods of X-ray chemical analysis are already fairly well known.

The first, which may be called X-ray spectrum analysis, is the result of the classical experiments of Moseley and consists in attaching the substance to be investigated to the target of an X-ray tube and photographing its X-ray line spectrum. The second method which may be called the X-ray absorption band method is due to the discovery of Barkla of the X-ray absorption band of the chemical elements.

The purpose of this paper is to describe a third and fundamentally different method of X-ray chemical analysis. It is simpler than the other two in that it does not require a spectrom-

eter, and it supplements them in that it gives evidence which they do not supply, namely, the state of chemical combination for each of the elements present.

The method consists in reducing to powder form the substance to be examined, placing it in a small glass tube, sending a beam of monochromatic X-rays through it and photographing the diffraction pattern produced. The only apparatus required is a source of voltage, and X-ray tube and a photographic plate or film. The amount of material necessary for a determination is one cubic millimeter. The method is applicable to all chemical elements and compounds which are crystalline in structure.—J. Am. Chem. Soc., 41 (1919), 4168. (J. L. M.)

Crystal Violet.—*Use as Indicator.*—Durrant, at a recent meeting of the Chemical Society, explained the uses of crystal violet as an indicator. The demonstration was as follows: Dissolve 0.25 gramme in distilled water, dilute to 100 mls. Drop 0.2 mil of this solution from a burette into each of ten test-tubes. Introduce 10 mls of the following acids into separate test-tubes, and 10 mls of water into another test-tube.

Relative Hydron Content.		
1. Twice normal HCl	gives full yellow tint	180 (?)
2. Normal HCl	gives greenish yellow tint	100
3. N/10 HCl	gives full green tint	10.5
4. N/100 HCl	gives deep blue tint	1.1
5. Normal acetic	gives blue-violet tint	0.34
6. Distilled water	gives violet tint	0.0000 (?)
7. Normal formic	gives deep blue tint	1.3
8. Normal oxalic	gives green tint	17.4
9. Normal sulphuric	gives yellowgreen tint	54.7
10. Twice normal sulphuric	gives greenish yellow tint	104 (?)

It appears that hydron content of aqueous solution of acids within a limited margin of error may thus be indicated. With care this margin may be made very narrow. The "weaker" the acid, the nearer is the tint to the violet end of spectrum. Subsequent paling occurs with yellow, green, and blue-green tints, the pale tints then are permanent, showing equilibrium. Crystal violet affords also an ocular demonstration of: (a) Reversible changes—since dilution, or careful addition of alkali, re-converts the "acid" tints to violet. (b) Progress of hydrolysis is best shown with 2 N, N, N/2, N/4. Caustic soda—color disappears in one.

two, four, eight minutes, or proportionately. The dye-concentration should be constant. With constant alkali-concentration the times required are directly proportional to the dye-concentrations.—Chem. and Drug., 91 (1919), 494.

Electro-Analysis.—*Without the Use of External Electric Energy*—M. François finds that when a solution of a metallic salt to which sulphuric acid has been added is placed in a platinum crucible, and a rod of zinc or aluminium is suspended in the solution so as not to touch the bottom of the crucible, a current is set up, and a deposit of the metal contained in the salt is obtained and can be weighed. To determine silver or gold the solution must contain potash and potassium cyanide and ammonia as well as the salt to be determined, while with mercury the liquid must consist of sulphuric acid containing a small proportion of potassium iodide. The operation takes twenty-four hours and the results obtained are exact.—Comptes rend.; through Chem. News, 118 (1919), 83.

Magnesium Hydroxide.—*Influence of Ammonium Salts on Its Precipitation.*—Ammonium sulphate is rather more effective than the chloride in holding up magnesium hydroxide. This fact does not agree with the theory given in many text-books to explain the mechanism of the hindrance that ammonium salts have on the precipitation of magnesium salts. Unsuccessful attempts were made to apply this knowledge to the separation of calcium and magnesium. Aside from the fact that, in presence of sulphates, solutions of calcium salts must be highly diluted, which is inconvenient, the writer has failed to obtain exact or even concordant results.—Helv. Chim. Acta; through Analyst, 44 (1919), 245. (J. K. T.)

Oxidizing Reactions.—*Influencing Equilibrium in.*—When ferric salts are estimated iodometrically towards the end of the titration the oxidizing and reducing strength become apparently equal and in order to complete the reaction, acid has to be added. C. Blomberg reports on the examination of various products to be added in the titration in order to overcome the equilibrium and in the course of his investigations he found that by an addition of sodium pyrophosphate a reversion of the titration can be effected and ferrous salts can be estimated iodometrically.—Pharm. Weekblad, 56 (1919), 793. (H. E.)

Paper Pulp.—*Use in Analysis.*—For filtering fine precipitates such as barium sulphate, calcium oxalate, sulphur, ferric hydroxides, aluminum hydroxide, Hackl recommends adding filter-paper pulp to the solution containing the precipitate. The pulp, however, should not be used when a silica precipitate is to be separated from a solution containing aluminum salts, because these seem to have an astringent action on the fibers, thus retarding the filtering. The addition of pulp to a mixed precipitate of aluminum and ferric hydroxides has the advantage that, after ignition, the oxides are in a very fine state of division and are readily soluble in hydrochloric acid.—*Drug. Circ.*, 63 (1919), 285.

Fiftieth Normal Potassium Hydroxide.—*Preparation of.*—W. J. Thompson and J. P. Snyder call attention to the indefiniteness of the U. S. P. concerning the use of indicators in verifying the titer of this solution and of N/10 sulphuric acid, both of which are used in the determination of alkaloids. Fiftieth-normal potassium hydroxide is standardized against potassium bitartrate, phenolphthalein being the indicator. In the determination of alkaloids, the indicator may be a hematoxylin, cochineal, methyl red or iodeosin. "The relative value of the two volumetric solutions should be determined each time, using the indicator employed in the assay." Furthermore, "the question naturally arises to which should we adjust or factor the solutions, to the N/50 potassium hydroxide, standardized against potassium bitartrate using phenolphthalein as indicator, or the N/10 sulphuric acid standardized against anhydrous sodium carbonate, methyl orange as indicator?" For very accurate work standardization should be against that which makes use of the same indicator that will be used in the assay. Methyl red which is used often in titrating alkaloids is not adapted for use with carbonates or organic acids making its use with either potassium bitartrate or sodium carbonate impossible.

Often the U. S. P. method is sufficiently accurate but where alkaloidal content is high an error of one per cent. in a solution would make considerable variation in results. Differing reports of different laboratories may be traceable to different methods in standardizing solutions. The Pharmacopœia should give us very definite instructions. The barium sulphate method of standardizing sulphuric acid gives good results but is long. The authors have obtained good results from the method of G. Incze (see *YEAR BOOK*, 1917, 257) which is as follows: Accurately weigh 0.2 gramme

of yellow mercuric oxide and transfer it to a beaker. Add 10 mils of a 60 per cent. solution of potassium iodide and stir until no oxide remains. Then add 50 mils of sulphuric acid (approximately N/20) and a few drops of methyl red test solution. Add potassium hydroxide from a burette until the pink color is destroyed. Make a blank test.

"Let x equal strength of potassium hydroxide solution in terms of N/50.

Let y equal strength of sulphuric acid solution in terms of N/20.

Let A equal number of mils of potassium hydroxide consumed in the titration.

Let B equal the number of mils of potassium hydroxide consumed in the blank.

Let C equal the weight of mercuric oxide.

Then x equals $0.5181C (B - A) 0.0011222$, y equals $Bx/125$."

The liberated potassium hydroxide may be titrated indirectly.
 $\text{HgO} + 4\text{KI} + \text{H}_2\text{O} = \text{K}_2(\text{HgI}_4) + 2\text{KOH}$.—J. Am. Pharm. Assoc., 8 (1919), 101. (Z. M. C.)

Quinosol.—*Use as a Reagent for Metals.*—N. Schoorl finds that extremely delicate reactions are given by quinosol or "superol" (*o*-hydroxyquinoline sulphate) with arsenic (arsenate), barium, mercury (mercurous), lead, strontium, tin (stannous and stannic), iron (ferrous), and silver. The precipitates formed are microcrystalline and of most characteristic appearance. The reagent is well adapted to microanalysis.—Pharm. Weekblad; through J. Soc. Chem. Ind., 38 (1919), 269A.

Sodium Thiosulphate Solutions.—*Standardization of.*—I. M. Kolthoff tried the various reagents used for standardizing sodium thiosulphate solution and found that the errors in applying these were only very slight: 0.2 per cent. in the case of oxalic acid; 0.1 per cent. of potassium iodate; 0.5 per cent. of potassium bromate; 0.0 of iodine; and 0.7 per cent potassium bichromate. The relatively great error obtained with potassium bichromate may be due to a side reaction between the hydriodic acid and chromic acid or to the fact that the exact atomic weight of chromium is not known at the present time.—Pharm. Weekblad, 56 (1919), 644. (H. E.)

Sodium Thiosulphate Solutions.—*Stability of.*—Volumetric sodium thiosulphate solutions generally become weaker on standing, due either to the oxidation of the thiosulphate by the oxygen

of the air, especially when kept in flint bottles and exposed to the light, or to the action of sulphur absorbing micro-organisms. In order to prevent deterioration of the solutions, I. M. Kolthoff recommends keeping them in well-cleaned, stoppered bottles in diffused sunlight or in a dark place and adding to each liter 200 mgm. of sodium carbonate or, when an alkalinity is not desired, 10 mgm. of mercuric iodide.—Pharm. Weekblad, 56 (1919), 878. (H. E.)

Starch-Iodide Reaction.—*Sensitiveness of.*—I. M. Kolthoff found that in the titration of iodine with sodium thiosulphate solution preferably 5 mls of a 2 per cent. starch solution should be used for every 50 mls of liquid to be titrated. The test solution is prepared by titrating 2 grammes of soluble starch and 10 mgm. of mercuric iodide with a small quantity of cold water and adding the turbid liquid to about 980 mls of boiling water. The solution thus prepared, with mercuric iodide as preservative, keeps very well even in flint bottles. The color change is less distinct when less indicator is used, while on the other hand a larger amount of indicator does not increase the sensitiveness. The author further found that acids, especially sulphuric acid, increase the sensitiveness, as do salts in the following descending order: aluminum, barium, calcium, magnesium, ammonium, potassium, lithium and sodium. Sulphates increase the sensitiveness more than chlorides, but in the absence of iodides the reverse is the case. Thiosulphate decreases the sensitiveness considerably, as do non-electrolytes such as the alcohols, albuminoids, peptones, etc. It is also decreased by temperatures higher than 15°.—Pharm. Weekblad, 56 (1919), 391. (H. E.)

Water Vapor.—*Adsorption by Solids.*—After reviewing the literature on this subject, K. Scheringa reports on experiments which he made with powdered paraffin, powdered paraffin and charcoal, potassium chlorate, sodium chloride, ammonium chloride, calcium hydroxide, calcium carbonate, calcium sulphate, soap solution, etc., in regard to the adsorption of gases and found that this is so small as not to have any influence on the accuracy of the weighing. Very fine powders are liable to adsorb water, thus 50 grammes of potassium bromide when weighed in a moist atmosphere (75 per cent. humidity) adsorbed 5 mgm. of water during the weighing.—Pharm. Weekblad, 56 (1919), 94. (H. E.)

COMMERCIAL CHEMISTRY.

Belfast.—*Chemical Imports and Exports.*—The imports of chemicals and drugs into Belfast were 2,709 tons in 1918 and the exports were 114 tons compared to 2,381 tons and 63 tons, respectively, in 1917. The imports of cream of tartar totaled 129 tons in 1918 and 98 tons in 1917.—*Chem. and Drug.*, 91 (1919), 92. (K. S. B.)

Chemical Industries.—*Promotion in Great Britain.*—A review of the steps which have been taken in Great Britain to form new chemical industries, and to re-instate or increase production of old industries, is given by S. W. Woolley. Analytical reagents, glassware, scientific instruments, and various drugs and chemicals, etc., are considered in classes, attention being drawn to the condition of that particular industry before and since the war. The foundation of an institute for pharmaceutical research is recommended.—*Chem. and Drug.*, 91 (1919), 149–152. (K. S. B.)

Chemical Industry.—*Germany and the American.*—The Alien Property Custodian has issued a report which, in part, is devoted to a discussion of the influence which Germany has had on the chemical industry in the United States. It outlines how the German government obtained a practical monopoly in the United States in dyes, fine chemicals and synthetic drugs. The report explains how by-products of the dye works were converted into explosives—trinitrotoluene, for instance—and the advantage which the production of these explosives gave to Germany as a military power. The report explains that in medicinal chemicals very little real manufacture existed in the United States. The report discusses the ramifications of the "Bix Six"—the German concerns which controlled the dye industry—in American industrial life. The report closes with a description of a corporation to be known as the Chemical Foundation, Inc., which is to acquire by purchase the German patents which in the past have formed a colossal obstacle to the American dyestuff industry. The Alien Property Custodian has sold to this company for the sum of \$250,000 approximately 4,500 patents.—*J. Am. Med. Assoc.*, 72 (1919), 1176. (W. A. P.)

Chemical Syndicate.—*Formation of.*—A syndicate has been formed in Helsingfors for the manufacture, in Finland, of acids

and other chemicals. Sufficient saccharin to supply the home demand will be produced according to the present plans.—Chem. and Drug., 91 (1919), 51. (K. S. B.)

Chemicals.—*Canadian Imports.*—During the year ended Nov., 1918, Canada imported drugs, dyes and chemicals valued at \$32,336,426, compared to \$26,197,916 during the previous year.—Chem. and Drug., 91 (1919), 167. (K. S. B.)

Chemicals.—*Canadian Exports of.*—During the year ended March, 1919, the British imports of drugs, dyes, chemicals, and medicines from Canada amounted to \$32,789,000, against \$26,520,000 in 1918 and \$27,600,000 in 1917.—Chem. and Drug., 91 (1919), 904. (K. S. B.)

Chemicals.—*Canadian Production.*—For some years Canada has been producing aspirin at the rate of 14,000 lbs. to 15,000 lbs. per month, some of which has been exported to England, South Africa and Japan. A company has been formed in Ontario to manufacture benzoic acid, sodium benzoate, benzaldehyde, vanillin, and coumarin. About 5,000 lbs. of sal ammoniac per day are produced. A plant which is expected to turn out 120 tons of soda ash per day has just been erected. During the year ended March, 1916, Canada imported 643,000 cwt. of soda ash, against 542,000 cwt. the previous year.—Chem. and Drug., 91 (1919), 253. (K. S. B.)

Chemicals.—*Dutch Manufacture of.*—An article devoted to an exhibition of Dutch chemical products, held in Utrecht, enumerates many of the chemicals now being produced in Holland, among which appear mineral acids, alkalies, silver salts, iodine, alcohols, etc., coal-tar products, synthetic perfumes, fats, fixed oils, gelatin and casein, along with various by-products incidental to the production of the above-mentioned articles. Many of these industries are expected to prove permanent, but some are designated as war emergency products, conditions rendering doubtful their successful continuance under peace conditions being mentioned.—Chem. and Drug., 91 (1919), 6. (K. S. B.)

Chemicals.—*Japanese Exports and Imports.*—A tabulated statement of the amounts of the Japanese exports and imports of various

drugs, chemicals, and allied substances for the years 1916, 1917 and 1918 is given.—Chem. and Drug., 91 (1919), 582. (K. S. B.)

Chemicals.—*Quality of, during the War.*—H. E. Buc states that, as the results of the examination of a large number of chemicals received by the Bureau of Chemistry, a marked falling off in the quality was noted after the first year of the war.

Liquid inorganic chemicals, such as hydrochloric, sulphuric, nitric, and phosphoric acid and ammonia, were generally found satisfactory. Liquid solvents, such as alcohol, ether, acetone, chloroform, carbon tetrachloride, carbon disulphide, etc., were found satisfactory for practically all purposes. Acetic acid of high degree of purity, absolute ether, amyl alcohol of good quality, and benzene were almost impossible to obtain.

Summarizing his findings Buc states: Most of the chemicals examined are satisfactory. Occasionally impurities are found often enough in chemicals from practically all manufacturers to make it necessary to test all shipments. The standard acids, ammonia, alkali salts, and alkali and most of the organic solvents are generally satisfactory.

The soluble salts other than alkali salts are generally acceptable but are seldom of a high degree of purity.

Certain organic solvents and solids are either unobtainable or unsatisfactory. The insoluble products are generally unfit for use in analytical work.—J. Ind. Eng. Chem., 11 (1919), 1140. (L. A. B.)

China.—*Chemical Industry of.*—Several factories have been erected in the province of Kwan-tung, China, for the manufacture of sulphuric acid, caustic soda, creosote, stearin, glycerin, and soap.—Chem. and Drug., 91 (1919), 858-859. (K. S. B.)

India.—*Chemical Trade of.*—A tabulated report of the British Indian imports and exports of drugs, chemicals and allied products for the years 1913 to 1917 is given.—Chem. and Drug., 91 (1919), 612-3. (K. S. B.)

South Africa.—*Chemical Imports of.*—During 1918 the Union of South Africa imported drugs, chemicals, and apothecaries' wares to the value of £1,254,223, compared to £1,000,606 in 1917. The imports of apothecaries' wares of all kinds amounted to £90,234,

compared to £77,110 in 1917; medical preparations, £147,558, compared to £122,038 in 1917; unenumerated drugs and chemicals, £335,854, against £201,004 in 1917; disinfectants and germicides, £114,886, against £81,391 in 1917.—Chem. and Drug., 91 (1919), 479. (K. S. B.)

South Africa.—*Chemical Imports from United States.*—During November the following chemicals, etc., were imported into the South African Union from the United States: Carbolic acid, 1,300 lbs.; beeswax, 280 lbs.; copper sulphate, 11,200 lbs.; glycerin, 100 lbs.; hops, 2,778 lbs.; paraffin, 300,600 lbs.; potassium chlorate, 57,120 lbs.; soda ash, 401,986 lbs.; caustic soda, 4,782 lbs.; sulphur, crude, 22 tons; superphosphates, 100 tons.—Chem. and Drug., 91 (1919), 189. (K. S. B.)

South Africa.—*Chemical Products of.*—The Union of South Africa is now producing Glauber and Epsom salts, sulphuric, nitric and hydrochloric acids (both pure and commercial), and a high grade of nut oil. Experiments with the cultivation of medicinal roots and herbs are being carried on.—Chem. and Drug., 91 (1919), 479. (K. S. B.)

South Africa.—*New Industries of.*—Among the new industries established in South Africa during the war are the manufacture of calcium carbide, bleaching-powder, ammonium sulphate, alcohol motor fuel, the production of arsenic, manufacture of starch from maize, antimony smelting, manufacture of glass bottles and manufacture of raw wax from by-products of sugar-cane.—Chem. and Drug., 91 (1919), 479. (K. S. B.)

MISCELLANEOUS.

Chemical School.—*Endowment of.*—The British oil companies have jointly contributed the sum of £210,000 for the endowment of a chemical school at the University of Cambridge.—Chem. and Drug., 91 (1919), 476. (K. S. B.)

Chemistry.—*Origin of the Word.*—Leo Suppan discusses the origin of the word "chemistry" at considerable length.—Nat. Drug., 49 (1919), 293. (C. M. S.)

Colloidal Chemistry.—*Institute for Research in.*—An institute for colloidal research has been founded in Frankfurt. It is the first of its kind, and owes its initiative to Paul Ehrlich.—Chem. and Drug., 91 (1919), 190. (K. S. B.)

Color Changes.—*Action of Heat on Certain Chemicals.*—H. T. Pinnock, discussing the detection of heated parts of machinery, employs the suggestion of Tonner, in painting on the machine a disc of the chemical mixture that will change color on heating. He finds that silver-mercury iodide, AgIHgI_2 , changes on heating to 90° to 100° from lemon-yellow to carmine; that cuprous-mercury iodide, $\text{Cu}_2\text{I}_2\text{HgI}_2$, changes at 60° to 70° from vermilion to chocolate-brown; that 85 parts of cuprous iodide and 15 parts of silver iodide change from vermilion to black.—J. pharm. chim., 20 (1919), 98.

Explosives.—*Hydrolysis to Fertilizers.*—When submitted to the action of slaked lime and water, with pyridin as catalyzer, cordite yields a brown mass containing chalk, calcium oxalate, nitrate, nitrite, acetate, formate, hydropyruvate and dihydroxybutyrate, says T. M. Lowry. No glycerin is obtained, nor is cellulose obtained in the hydrolysis of nitrocellulose. Due to the calcium hydroxypyruvate, the product exhibits a toxic action upon some plants when used as a fertilizer.—Chem. and Drug., 91 (1919), 1433. (K. S. B.)

Gas Warfare.—Robert P. Fischelis relates experiences in the Gas Defense Division of the Chemical Warfare Service during the World War. Brief history of gas warfare and offensive and defensive measures employed are described. Composition of and experimental work on gas masks is given in detail with description of control tests employed.—Proc. Penna. Pharm. Assoc., 42 (1919), 245. (R. P. F.)

Minerals.—*Indian Production of.*—The production of monazite in Travancore during 1917 was 1,940 tons, valued at £56,489 against 1,292 tons, valued at £37,714, in 1916. The magnesite produced in 1917 amounted to 18,202 tons, valued at £14,559 against 17,640 tons in 1916. Saltpetre fell from over 25,000 tons in 1916 to 21,283 tons, valued at £527,666, in 1917. The exports of the latter were 485,000 cwt. in 1916 and 515,374 cwt., valued at £677,856, in 1917.—Chem. and Drug., 91 (1919), 223. (K. S. B.)

Minerals.—*Separation by Decrepitation.*—T. M. Lowry suggests the separation of minerals by decrepitation. As an example, he heats barytes, separating white from colored by sieving the residue several times with sieves of various size meshes.—*Chem. and Drug.*, 91 (1919), 1433. (K. S. B.)

Mineralogical Notes.—G. E. Éwe presents a paper on miscellaneous information including analyses of samples of potter's clay, a discussion of Spanish brown, an analysis of a tripoli from Western United States, a note on the quality of fuller's earth and a discussion of terra alba. The latter he now finds is usually a white non-setting calcium sulphate.—*Am. J. Pharm.*, 91 (1919), 795.

Pharmaceutical Chemist.—*The Scope of His Work.*—F. O. Taylor in an address calls attention to some of the many problems pertaining to the origin, preparation, dispensing and effects of the many substances used in the treatment of disease.

Instances are given of the contributions to pharmaceutical chemistry by the metallurgist, the coal-tar industry, the dye chemist, physical chemistry, radiochemistry, the petroleum industry, organic chemistry, etc., each of which contributes its share to the problems to be solved by the pharmaceutical chemist.

Brief reference is made to some of the great problems now confronting the pharmaceutical chemist, of which the following may be mentioned: The relationship between chemical constitution and physiological action, the constitution of alkaloids; of enzymes; the constitution of the vitamins, etc.—*J. Ind. Eng. Chem.*, 11 (1919), 239. (L. A. B.)

Research Institute.—*Recommendation for Establishment in Holland.*—A commission appointed by the Dutch Association for the Promotion of Medicine recommends the establishment of an institute whose purpose shall be the investigation of the composition, purity, and pharmacological action of drugs, patent medicines, invalids' foods, etc., and the supply of reliable abstracts of current literature to doctors. The results would be published periodically, and supplied to medical and pharmaceutical journals.—*Chem. and Drug.*, 91 (1919), 560. (K. S. B.)

School of Chemical Industry.—*Establishment in Spain.*—A school of chemical industry has been formed in Barcelona, Spain.

The instruction given includes the elaboration of plans for the establishment of factories for the production of various chemicals, including wood distillation, and electrolytic works. The production, in the laboratories, of a number of fine chemicals for pharmaceutical use was accomplished.—Chem. and Drug., 91 (1919), 1220. (K. S. B.)

Waste Products.—*Utilization of.*—The Chemical Waste Products Committee, appointed by the Munitions Inventions Committee, to inquire into the utilization of waste products, report that the arsenic sulphide remaining from the purification of sulphuric acid may be separated as a sludge by heating to 200° , when the sulphuric acid may be syphoned off and the residue, when washed and dried, smelted for arsenic. Other waste products, containing selenium, were examined. The flue dust of pyrites burners contained negligible amounts, while deposits in the Glover tower and sulphuric acid chambers yielded from 0.3 per cent. to 4 per cent.—Chem. and Drug., 91 (1919), 574. (K. S. B.)

NON-METALLIC ELEMENTS

OXYGEN.

Oxygen.—*Apparatus for Administration.*—J. S. Haldane describes apparatus for continuous administration of oxygen. In cases of poisoning by irritant gas, and in various other conditions, one of the main dangers is due to the fact that the partial pressure of oxygen in the lungs becomes inadequate to oxygenate the blood. It is, therefore, necessary to add oxygen to the inspired air until a sufficient degree of recovery takes place. With the help of a reducing valve and graduated tap, a constant stream of oxygen of the required amount is delivered into the small bag attached to the face-piece. This bag is emptied at each inspiration, none of the oxygen being wasted. The administration can thus be continued, if necessary, for several days, as the consumption of oxygen is reduced to a minimum.—Chem. News, 118 (1919), 285.

Ozone.—*Detection and Assay of.*—Ozone has the property of decolorizing diluted fluorescein solutions and destroying their fluorescence. L. Benoist found that when a 0.0001 per cent.

solution of fluorescein is shaken with ozonized air, the color and fluorescence are destroyed immediately. When stronger solutions of fluorescein are used only the fluorescence disappears, while the color partly remains. This reaction is not influenced by other gases which generally accompany ozone such as nitrous acid and chlorine and is more sensitive than the potassium iodide reaction which, besides, is not at all specific. It is claimed that by the fluorescein reaction which can also be applied for estimating ozone in a specially constructed apparatus, 0.0000001 mg. of ozone can be detected. The fluorescence disappears when two molecules of ozone act on one molecule of fluorescein.—Compt. rend.; through Pharm. Weekblad, 56 (1919), 1308. (H. E.)

Hydrogen Dioxide.—*Assay and Preservation of.*—I. M. Kolthoff found that when hydrogen dioxide is mixed, according to Rupp, with sodium hypoiodite and when the excess of iodine is titrated back with sodium thiosulphate solution, too low results are obtained. A rapid method consists in diluting the hydrogen dioxide solution with 20 times its volume of water, adding to 25 mls of the solution 10 mls of N/4 sulphuric acid, 10 mls of normal potassium iodide solution and 3 drops of normal ammonium molybdate solution as a catalyzer and titrating the liberated iodine at once with sodium thiosulphate solution. Furthermore, Kolthoff reports on a number of experiments carried out in regard to the preservation of hydrogen dioxide. Phenol, acetanilid, benzoic acid and salicylic acid in varying quantities were used and the solutions were allowed to stand both in flint glass and amber glass bottles. It was found that the deterioration during two months is only very slight when the solution is kept in amber bottles and when 75 mgm. of acetanilid or 100 mgm. of either phenol, benzoic acid or salicylic acid per liter are added. An addition of acetanilid, especially when the solution is kept in flint bottles, is not to be recommended, because the solution is easily discolored and nitrobenzene is liable to be formed. Hydrogen dioxide solution should be acid or at least slightly acid to dimethyl yellow.—Pharm. Weekbl., 56 (1919), 949. (H. E.)

Hydrogen Dioxide.—*Use in Mustard Gas Burns.*—Rousseau and Devaux report that the free application of hydrogen dioxide to the affected parts quickly relieves the intense pain occasioned by contact with dichlorethylsulphide, "mustard gas" or "yperite."

In half an hour the copious use of hydrogen dioxide greatly lessens the pain, and completely suppresses it in less than ten hours. The edema shows improvement in a few hours, and disappears in six days. Since fats dissolve the mustard gas, and protect it from the action of the nascent oxygen, no ointments or oily dressings should be applied to the lesions.—J. Méd. Bordeaux; through Pharm. J., 103 (1919), 64.

"Per Salts."—*Use in Washing Powders.*—A number of so-called washing powders on the market, and containing substances readily yielding oxygen, were examined by H. Kuehl. It was found that none of the fabrics experimented with were injured by percarbonates. If the fabric was injured, this was not due to the percarbonate, but to presence of sodium silicate, free alkali, sodium sulphate containing considerable iron, etc. Persulphates, however, should not be used in washing powders, as it was found that under certain conditions likely to obtain, free sulphuric acid was formed.—Chem. Ztg., 43 (1919), 354. (G. C. D.)

Peroxides and Chlorates.—*Discrepancies in Assay of.*—When peroxides or chlorates are distilled in the presence of hydrochloric acid, the distillate is received in potassium iodide solution and the iodine, liberated by the chlorine, titrated in the usual way, results are obtained which are from 0.5 to 2 per cent. too low, because, as E. Rupp has found, the chlorine acts on the water vapors according to the equation: $\text{Cl}_2 + \text{H}_2\text{O} = 2\text{HCl} + \text{O}$, thus preventing a part of the chlorine from acting on the potassium iodide solution.—Zeitsch. anal. Chem.; through Pharm. Weekblad, 56 (1919), 307. (H. E.)

Sodium Peroxide.—*Assay of Active Oxygen in.*—Milbauer has found that the methods generally used for estimating active oxygen in sodium peroxide give inaccurate results, and, therefore, proposes the following modifications: First, 100 mls of water are mixed with 5 mls of concentrated sulphuric acid and 5 grammes of boric acid, 0.5 gramme of sodium peroxide is added in small portions, shaking the bottle briskly after each addition, and the liberated hydrogen peroxide is then titrated with potassium permanganate solution. Second, sodium peroxide is added in small portions to a solution of 2 grammes of potassium iodide in 200 mls of diluted sulphuric acid, 1 : 20. The iodine is then titrated in the usual

way with sodium thiosulphate solution. Third, 0.2 to 0.3 gramme of sodium peroxide is mixed with about 10 mls of a 0.05 per cent. copper sulphate solution in a small flask connected with a nitrometer. The flask is shaken, when decomposition is completed within one minute. The liberated oxygen is measured. The gas evolved contains about 0.32 per cent. of carbon dioxide and 0.08 per cent. of hydrogen.—J. prakt. chem.; through Drug. Circ., 63 (1919), 145.

Liquid Air.—*War Uses.*—In an address at the Royal Institution James Dewar discussed the use of liquid air during the war. Tanks having apparatus to regulate the flow were used to carry liquid air on airplanes, to supply oxygen to the aviators when at high altitudes. Fractional distillation produced free oxygen, and the nitrogen obtained was combined with hydrogen by passing a mixture of the two over osmium or finely divided iron at high pressure and a little below red heat, the resulting steam containing 6 to 8 per cent. of ammonia, which was separated by absorption in water or by freezing. This ammonia was used in the production of fertilizer and nitric acid, large quantities of the latter being needed for the manufacture of explosives.—Chem. and Drug., 91 (1919), 82. (K. S. B.)

HYDROGEN AND HELIUM.

• **Hydrogen.**—*Occlusion by Metals.*—D. P. Smith expresses his opinion that the capacity of a metal to occlude hydrogen is connected with its magnetic character. His views are given in a summary that follows the paper: "From a review of the literature relating to the occlusion of hydrogen by the metallic elements it is shown that the resulting alloys are clearly to be distinguished from other types of binary hydrogen compounds, and that the metals which form the alloys probably occupy a definite region in the periodic table of Werner. The metals of this region are classified into those which do, and those which do not, occlude in a degree measurable by the ordinary volumetric method. From a comparison with magnetic data it is shown that the occluding and non-occluding elements, excepting copper, rhodium, and thorium, are identical with those for which the specific magnetic susceptibility possesses a value respectively greater or less than about $+0.9 \cdot 10^{-6}$ at room temperature. It is concluded that the capacity of a metal to occlude hydrogen in large degree is an accompaniment of strongly magnetic character."—J. Phys. Chem.; through Chem. News, 118 (1919), 275.

Water.—*Carbonic Acid Assay of.*—R. Czeusny titrates the free carbonic acid with 1/20 normal sodium carbonate solution prepared by dissolving 2.6525 grammes of sodium carbonate and 2.5 grammes of phenolphthalein in one liter of water until the liquid shows a slight but permanent red color. The reaction depends on the conversion of the carbonate into bicarbonate. From the amount of carbonate solution used 0.52 mil should be subtracted for carbonic acid present in every water.—Z. anal. Chem.; through Pharm. Weekblad, 56 (1919), 1327. (H. E.)

Water.—*Nitrate Assay of.*—R. C. Frederick finds that nitrates associated with chlorides up to 100 parts chlorine per 100,000 can be very accurately estimated by using a phenolsulphonic-sulphuric acid mixture made as described. The color produced by the nitrates, which is very pure, is compared with that produced by a standard ammonia solution.—Chem. News, 118 (1919), 298.

Water.—*Sulphate Assay of.*—In order to render the barium sulphate crystalline and easily filtrable V. Froboese proceeds as follows: 2 drops of methyl orange are added to 200 to 300 mls of the water and the liquid is neutralized with N/10 hydrochloric acid, whereby the temporary hardness is determined at the same time. After the addition of another 2.5 mls of N/10 hydrochloric acid, the mixture is boiled, a slight excess of 2 per cent. barium chloride solution is added and the boiling is continued for 10 minutes longer. The turbid liquid becomes clear due to the separation of barium sulphate as crystals. The liquid is then allowed to cool, the barium sulphate collected on a filter and estimated in the usual way.—Chem. Ztg.; through Pharm. Weekblad, 56 (1919), 1424. (H. E.)

Water.—*Detecting Poisons in.*—In view of the systematic contamination of water by poisons practiced by the German armies in France, Gentilucci recommends the application of the following simple tests: (1) A sheet of copper immersed in water, hot or cold, should remain unaltered (absence of mercury and arsenic); (2) the reaction with potassium iodide in the presence of sulphuric acid should be negative (absence of lead, copper, mercury salts, including cyanides); (3) with nascent hydrogen (zinc and sulphuric acid) the Gutzeit test should be negative (absence of arsenic and antimony). In addition, the water should be extracted

with chloroform—(a) in alkaline or acid solution, leaving no residue, or only a slight residue, in which case it should not be altered by phosphotungstic acid or solution of potassium iodide (absence of alkaloids, glucosides, ptomaines); (b) in solution of sodium bicarbonate, the residue, if any, should give no reaction with Froehde's solution (absence of morphine). Potassium cyanide was found in a number of samples of water contaminated by the Germans in France.—Boll. chim. farm.; through Chem. and Drug., 91 (1919), 15.

Water.—*Longevity of Bacteria in.*—Maud Mason Obst reports the results of re-examination of many samples of bottled water which had been stored in the Bureau of Chemistry. The standard methods of the American Public Health Association were used. The tables which are given contain much valuable data. Some of the conclusions reached are as follows: "Water can be stored in bottles so that contamination will not enter; a re-examination of a stored bottled water within 30 days may or may not give the same total count as the first examination but it is improbable that the *B. coli* will ever be found to have increased; pollution can be detected in a bottled water even after three years of storage and such water may not be safe for drinking purposes; the presence of certain salts seems to aid the longevity of bacteria in commercial waters, while the presence of other salts seems to have the opposite effect; the presence of molds in large numbers in a bottled water suggests storage; *B. coli* in symbiosis with water bacteria, may live in bottled spring waters for several years and it is not safe to assert that *B. typhosus* and others of these groups will not survive long periods of storage under symbiotic conditions; *B. coli*, *B. dysenteriae* and *B. typhosus* in pure culture did not multiply when inoculated into sterilized bottled spring water;" *B. typhosus* and *B. dysenteriae* live for some time; results indicate that certain chemicals in natural spring waters may inhibit the existence of bacteria.—J. Am. Pharm. Assoc., 8 (1919), 735. (Z. M. C.)

Water.—*Sterilized Distilled.*—E. Fullerton Cook and Louis Gershenfeld believe that the U. S. P. directions for this product are not as simple as they first appear and they make very plain the necessity for extreme caution. The requirement for freshly distilled water must not be ignored since distilled water a few days old has many bacteria which will be killed by sterilization but will

produce a "bacterin." Toxins produced during the life of the bacteria remain also and, if the water is used to dissolve a remedy to be administered intravenously or subcutaneously, might cause serious consequences. Tap water is worse for it often contains dissolved solids besides bacteria and toxins.

The pharmacopœial direction to use "a flask of hard glass" is necessary also for the hour's boiling in an ordinary flask dissolves silicates which later separate in fine needle-like crystals. The flask itself is directed to be sterilized and unless this is done the water is not sterile. Having met all these conditions the authors found that boiling for thirty minutes did not always give a sterile product. To insure sterility the direction should say "active boiling."

Replacing the cotton plug of the flask with a sterile rubber stopper carrying two tubes, one, plugged with cotton, for intake of air, the other bent to serve as siphon when the flask is inverted, was found to be an improvement.

An Arnold sterilizer did not yield a sterile product though reheating on successive days probably would. Neither did direct distillation from a Liebig condenser give a sterile product. Several tables are given to show exactly the findings in each of the fourteen experiments. Finally they conclude that the autoclave method is practicable and should be suggested in the text of the U. S. P.; the distilled water must be fresh; the flask must be of hard glass and sterile; the boiling must be active for at least thirty minutes. Cotton or rubber with tubes may be used for stopper.—J. Am. Pharm. Assoc., 8 (1919), 116. (Z. M. C.)

Water.—*Treatment to Prevent Growth of Clostridia.*—The troublesome algæ in municipal water is *clostridia* and water engineers are giving its removal much consideration. F. C. Amsbary finds that chlorine in proportion of $4\frac{1}{2}$ pounds per million gallons caused it to disappear—a conclusion concurred in by W. F. Montfort.—J. Am. Water Works Assoc.; through Chem. Abstracts, 13 (1919), 173.

Helium.—*Bibliography.*—E. R. Weaver has prepared a painstaking bibliography of helium, citing 388 papers on the subject.—J. Ind. Eng. Chem., 11 (1919), 682.

Helium.—*Production from Natural Gas.*—Frederick G. Cottrell, in his address of acceptance of the Perkin Medal, gave a review of

the history of the production of helium from natural gas.

A brief review of both the Linde and Claude systems of gas liquefaction and distillation and of the Norton process is given.

At the time of signing the armistice the first shipment of 147,000 cu. ft. of 93 per cent. helium was on the dock about to be loaded aboard ship for Europe.—J. Ind. Eng. Chem., 11 (1919), 148. (L. A. B.)

HALOGENS.

Halogens.—*Assay in the Presence of Each Other.*—Halogens can be determined by their different reduction potentials. I. M. Kolthoff gives the following process for determining chlorine, bromine and iodine in the presence of each other. The total halogens are assayed argentometrically. The iodine is then assayed by the iodate method in the presence of benzoic acid. In this method moderate quantities of chlorine are no disturbing factor. Iodine and bromine are then assayed by a modified Bugarsky method which is carried out as follows: To the bromide solution 25 mls of N/10 potassium iodate, 5 mls of normal sulphuric acid and 20 mls of water are added and the mixture is boiled over a small flame until the bromine is expelled. If the volume of the solution is reduced to 15 mls and the bromine should not be expelled altogether, 30 mls of water are added and the heating is continued. The operation is best carried out in a Kjeldahl flask. When all the bromine has been expelled, the mixture is cooled, potassium iodide and diluted sulphuric acid or hydrochloric acid are added and the liberated iodine is titrated with sodium thio-sulphate solution. The reaction takes place according to the equation: $\text{IO}_3^- + 6\text{H}^+ + 5\text{Br}^- = 5\text{Br} + \text{I} + 3\text{H}_2\text{O}$. Each mil of N/10 iodate solution corresponds to 5.6 mil of N/10 bromide. The chlorine is then calculated by difference.—Pharm. Weekblad, 56 (1919), 1298. (H. E.)

Halogens.—*Detection of Traces in Mixtures.*—A. J. Jones reports on tests which he claims are accurate in dilutions as low as 5 parts in 10000. *Iodide in bromides and chlorides* is detected by the use of sodium nitrite in acid solution, which liberates the iodine which can be detected by the pink chloroform solution.

Bromide in iodides is detected by addition of sodium nitrite in acid solution and separation of the iodine by repeated extrac-

tions with chloroform. After the iodine is removed, the residual liquid is treated with 0.5 per cent. potassium permanganate solution and the liberated bromine is detected by the yellow chloroform solution and then verified by boiling the chloroformic solution in a test-tube and allowing the bromine vapors to pass through a cap of filter paper moistened with "liquid fluorescein." When bromine is present the yellow stain will turn rose-pink.

Bromide in chlorides is detected as in the case of bromine in iodides, except that treatment with sodium nitrite is omitted.

Chloride in bromides and iodides. Treat the mixture with 0.5 per cent. permanganate solution, extract the liberated bromide and iodine with chloroform and when all iodine and bromine are removed, test residual liquid for chlorides with silver nitrate solution.

The success of the tests depend upon careful manipulation, for details of which the original paper must be consulted.—Chem. and Drug., 91 (1919), 1150. (K. S. B.)

Compound Solution of Chlorine.—*Use as a Pharmacopæial Reagent.*—E. Wende suggests, as something new, a compound solution of chlorine made from hydrochloric acid and potassium chlorate, as a chlorine water substitute. He gives details as to its use instead of chlorine water in testing bromides and iodides. For caffeine, theobromine and theophylline, he suggests the use of potassium chlorate and hydrochloric acid applied directly to the chemicals instead of chlorine water.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2963.

Dakin's Chlorine Antiseptics.—T. F. Guthrie in a catechismal discussion gives a description of Dakin's solution, chloramine-T, dichloramine-T, and chlorcosane.—Nat. Drug., 49 (1919), 119. (C. M. S.)

Chlorinated Alkalies.—*Constitution of.*—E. Justin-Mueller discusses the old problem of the structure of bleaching powder and of chlorinated soda and potassa. He prefers the Odling formula for chlorinated lime, CaOCl_2 , and for the same reason recommends that chlorinated soda and potassa be written, Na_2OCl_2 and K_2OCl_2 , instead of calling them mixtures of the chloride and hypochlorite of the metal. No original experimental work is reported in the paper.—J. pharm. chim., 20 (1919), 113.

Chlorinated Lime.—*Stabilizing.*—A. N. Meldrum has attempted to prevent decomposition of chlorinated lime by removing moisture, which he believes is the cause of its instability. In his desiccation experiments he used caustic soda, calcium chloride, phosphoric anhydride and sulphuric acid. The most rapid dehydration took place when phosphoric anhydride was mixed with mercuric chloride and mercury. Thus dried, the chlorinated lime was found to remain so stable that after one year it still contained 25 per cent. of available chlorine.—J. Soc. Chem. Ind., 38 (1919), 80T.

Chlorinated Lime.—*Danger in Opening Cans of.*—The increase in the use of chlorinated lime for household purposes has resulted in a somewhat greater prevalence of burns of the eye by this substance. During July and August some twenty cases were brought to the attention of the National Committee for the Prevention of Blindness. The circumstances in each case were that a sudden explosion of gas from the inside of the can followed the opening of the container, the shower of lime dust usually striking the eyes and face of the victim. In most cases, complete recovery followed, as medical care was usually provided immediately after the accident. In an endeavor to prevent these accidents, the national committee took up the matter with manufacturers and distributors. The latter report that chlorinated lime decomposes when exposed to high temperature or to dampness. To avoid accidents, it is recommended that a small hole be punched in the container to allow the gas pressure to be released before the top is taken off the can.—J. Am. Med. Assoc.; through Drug. Circ., 67 (1919), 518.

Hydrochloric Acid.—*Use in Neuritis.*—Sainsbury finds that strong hydrochloric acid (B. P.), applied to the skin along the line of the inflamed and painful nerve, has a remarkable effect in neuritis. The acid is applied by means of a wad of cotton wool (the fingers holding it being covered with vaseline) in a line $1\frac{1}{2}$ inches wide, and left to dry, no dressing being required. Rapid relief is afforded, and the application may be repeated twice a week.—Lancet; through Pract. Drug., Jan., 1919, 38.

Hypochlorites.—*Assay in the Presence of Chlorates.*—The following method for estimating hypochlorites in the presence of chlorates is given by Kolthoff: To 25 mls of N/10 arsenous acid solution, 5 mls of N/4 acetic acid and 3 drops of a 2 per cent. methyl

red solution are added, and then from a burette the hypochlorite solution until the liquid is decolorized. The quantity of hypochlorite solution required contains 88.75 milligrammes of active chlorine. To the colorless solution 25 mls of N/10 arsenous acid solution and 20 mls of strong hydrochloric acid are added and the mixture is boiled for five minutes. The excess of arsenous acid is then titrated back with N/10 potassium bromate solution, using indigo as an indicator. Each mil of arsenous acid solution consumed corresponds to 1.4 milligrammes of ClO_3 , or 3.45 milligrammes of active chlorine. The method can also be used for determining the strength of chlorine water.—Pharm. Weekblad; through Drug. Circ., 63 (1919), 19.

Chlorates.—*Iodometric Assay of.*—When chlorates are estimated iodometrically in a strongly acid solution too high results are obtained because a part of the hydriodic acid is simultaneously oxidized by the oxygen of the air. This can be avoided by adding to the chlorate solution 1.5 times its volume of concentrated hydrochloric acid or 100 mls of 1 per cent. potassium iodide solution. Much less of the reagent is required when the chlorate solution is boiled with 10 mls of N/4 hydrochloric acid, the liquid is allowed to cool to 50° , mixed with one gramme of potassium iodide and then titrated with sodium thiosulphate solution, heating the liquid gently towards the end of the titration.—Pharm. Weekblad, 56 (1919), 460. (H. E.)

Potassium Chlorate.—*Japanese Production.*—At the end of 1917 there were 49 factories, with a capacity of 10,000 tons per year, engaged in the manufacture of potassium chlorate in Japan. Only about 6,000 tons, however, was being produced annually.—Chem. and Drug., 91 (1919), 566. (K. S. B.)

Perchlorates.—*Rapid Assay of.*—J. G. Williams titrates perchlorates in the presence of chlorates and chlorides with TiCl_3 and determining the oxidation thereof with ferric alum using potassium sulphocyanate as indicator.—Chem. News, 118 (1919), 8. (J. H.)

Bromine.—*Manufacture in Tunis.*—Two factories for the manufacture of bromine and bromides have been established in Tunis, by a French firm. One is at El Haneche and one at Am-es-Serah.

The output is stated to be 100 tons per month.—Chem. and Drug., 91 (1919), 1177. (K. S. B.)

Brominated Lime.—Patents for a new bactericidal combination, consisting of compounds of bromine and lime, have been obtained in England by J. S. Arthur and L. G. Killby. The compounds are said to possess marked bactericidal properties and to be very much more stable than chlorinated lime. Large rotating drums, gas heated, are charged with lime and the necessary quantity of dry bromine, and as result of the reaction a dark red compound, having the formula of $\text{CaOBr}_2 \cdot \text{H}_2\text{O}$, is obtained. This compound in turn is heated in the same apparatus, with a further quantity of lime, for about 2 to 3 hours, when the combination desired is formed. This consists of a pale yellow powder, containing approximately 33 per cent. of available bromine, and having the the composition of CaO , CaOBr_2 , H_2O . Greater stability and more pronounced action are claimed for this compound, as compared to bleaching powder.—J. Soc. Chem. Ind., 38 (1919), 843A. (G. C. D.)

Hydrobromic Acid.—*New Method of Preparation.*—A. Pickles prevents the decomposition of hydrobromic acid by sulphuric acid by the addition of a small amount of stannous chloride. To 25 mls of bromide solution (90 grammes of potassium bromide in 150 mls) were added 3.4 mls of concentrated sulphuric acid after the addition of 0.2 gramme stannous chloride. No bromine was liberated, and by distilling a 95 per cent. yield was obtained. With an excess of acid similar results were obtained. When larger quantities of stannous chloride were used, basic tin compounds were formed.—Chem. News, 118 (1919), 89. (J. H.)

Bromates.—*Iodometric Assay of.*—I. M. Kolthoff found that when assaying bromates iodometrically the concentration of the potassium iodide solution, while of small importance, is best held at 5 mls of normal potassium iodide solution for every 25 mls of N/10 bromate solution or 0.5 ml of the former to every 25 mls of N/100 bromate solution. Acids accelerate the reaction, especially hydrochloric acid, and an excess of acid must be present as otherwise the thiosulphate is oxidized by the bromate to sulphate and the results are consequently too low. The best results are obtained when about 0.15 per cent. of acid is present in the liquid.

Furthermore the author found that ammonium molybdate is a good catalyzer in the reaction, as is also light; that, however, manganese, chromates, ferrous salts and other salts have no catalytic action. It is, therefore, advisable to add to the liquid to be titrated a few drops of normal ammonium molybdate solution. Heat also accelerates the reaction.—Pharm. Weekblad, 56 (1919), 426. (H. E.)

Iodine.—*Amount Present in Seaweed.*—W. Doherty finds that the Australian seaweed, *Ecklonia radiata*, contained 0.06 per cent. of iodine in the fresh weed, 0.40 per cent. in the dry and 1.5 per cent. in the ash. The latter also contained 18 per cent. of potassium oxide. European *Laminaria* species, when dried, yield from 0.28 to 0.48 per cent. of iodine.—Chem. Eng. Min. Rev. Australia; through Chem. Abstracts, 13 (1919), 364.

Iodine.—*Assay of.*—A method for estimating iodine depending on the conversion of the iodine into iodine trichloride, decomposing this with ferrous sulphate and titrating the liberated iodine with thiosulphate solution is given by N. Tarugi. Inorganic substances are dissolved in a small quantity of water, and into the solution, placed in ice, an excess of chlorine gas is conducted. The solution is then diluted to a certain volume and an aliquot part is shaken in a separator with ferrous sulphate solution and diluted sulphuric acid. After allowing to stand for one hour and a half, the liberated iodine is shaken out with chloroform, the chloroformic solution is washed with water and the iodine is titrated with sodium thiosulphate solution. Organic substances are heated in a retort with 5 to 10 mls of sulphuric acid per gramme substance and into the solution chlorine gas is conducted. The distillate is received in water and the assay then carried out as just given.—Gazz. chim. ital.; through Pharm. Weekblad, 56 (1919), 979. (H. E.)

Iodine.—*Iodotannic Test for.*—Tsakalotos and Dalmas point out that the sensitiveness of the iodotannic reaction is much greater than that of starch-iodide especially for dilute solutions of iodine, except in the presence of potassium iodide, which weakens the former reaction, while enhancing the sensitiveness of the latter. An excess of either iodine or tannin inhibits the formation of the red color in the iodotannic reaction.—Bull. soc. chim.; through J. Soc. Chem. Ind., 38 (1919), 235A.

Iodine.—*Japanese Exports of.*—The Japanese exports of crude iodine for the past three years were as follows: 1916, 3,044 kin.; 1917, 47,370 kin.; 1918, 61,389 kin.—Chem. and Drug., 91 (1919), 364. (K. S. B.)

Iodine.—*Presence in Plants.*—Winterstein examined 35 phanerogams for iodine and found it present only in beetroot, celery, cabbage, lettuce and carrots. None was found in mushrooms, yellow boletus or in normal milk, cow's urine or cheese. The paper gives the author's method of assaying such products, which it is claimed will show 0.04 milligramme of iodine in 10 grammes of the vegetable examined.—Z. physiol. chem.; through Pharm. Era, 52 (1919), 203.

Iodine.—*Manufacture in Eastern Siberia.*—D. F. Findlay in describing an iodine factory located north of Vladivostock states that the simplest methods are employed in the extraction of the element from seaweed ash.—Pharm. Jour., 102 (1919), 33. (C. W. B.)

Iodine.—*Solubility in Hydro-alcoholic Mixtures.*—N. Schoorl and A. Regenbogen found that the solubility of pure, resublimed iodine is 0.025 gramme in 100 mls of distilled water and 20 grammes in 100 mls of absolute alcohol. For making the determinations a solution of iodine in ordinary alcohol could not be used because these are readily decomposed with the formation of hydriodic acid. The experiments were, therefore, made with a concentrated solution of iodine in absolute alcohol, which was diluted with the desired amount of water and the resulting iodine solution after filtering through a pledget of cotton was assayed immediately. The following results were obtained:

Strength of alcohol.	Per cent. iodine dissolved.	Strength of alcohol.	Per cent. iodine dissolved.
100	20.0	45	0.8
95	14.8	40	0.55
90	11.4	35	0.35
85	9.0	30	0.2
80	7.2	25	0.11
75	5.6	20	0.08
70	4.3	15	0.06
65	3.2	10	0.045
60	2.3	5	0.033
55	1.7	0	0.025
50	1.2	..	....

The estimations were made at 15°. It was further found that in alcohol concentrations above 18 per cent. by the addition of water iodine was precipitated while in concentrations below 18 per cent. this was not the case. Therefore, from strong alcoholic solutions the maximum precipitation of iodine has taken place when the mixture contains 18 per cent. of alcohol.—Pharm. Weekblad, 56 (1919), 538. (H. E.)

Iodides.—*Assay of.*—I. M. Kolthoff in reviewing the various methods for estimating iodides found that by Pison and Bernier's method in which the iodide is oxidized to iodate by potassium permanganate and by Volhard's distillation method with ferric chloride good results are obtained even in the presence of bromine, but that these methods are very tedious and that the latter one requires a special distillation apparatus. Kolthoff gives then the following simple method: To the iodide solution acidified with benzoic acid an excess of volumetric potassium iodate solution is added, the iodine is boiled off and after cooling potassium iodide is added and the liberated iodine is titrated with volumetric sodium thiosulphate solution. Acidifying with sulphuric acid, succinic acid or acetic acid gave good results only in the absence of bromine.—Pharm. Weekblad, 56 (1919), 1029. (H. E.)

Iodides.—*Assay of Small Quantities of.*—E. Lasausse devised the following method of assaying the iodine content of seaweed, where the bromides and nitrites present are apt to interfere with the reaction. A solution containing 2 or 3 milligrammes of iodine (as iodides) is neutralized with phosphoric acid, diluted to 150 mls with water and is placed in a 600 or 700 mil precipitating jar. Then 4 mls of 50 per cent. phosphoric acid are added and enough 5 per cent. permanganate solution to make the fluid rose colored. The fluid is then bleached with 10 per cent. sodium bisulphite solution, is neutralized with 25 per cent. potassium hydroxide solution and then an excess of the potassium hydroxide solution (5 mls) is added, followed by permanganate solution until the fluid is a distinct pink. After adding talc, the mixture is boiled for 10 minutes, 25 grammes of crystalline sodium sulphate are added and then 10 mls of alcohol are added drop by drop, after which the mixture is boiled one to two minutes until a brown manganese precipitate is obtained. After cooling, the mixture is poured into

a graduated flask, enough water is added to make 220 mils and the mixture is then filtered; 200 mils of the filtrate being then assayed for iodine by addition of 8 mils of 50 per cent. phosphoric acid, 2 mils of 10 per cent. potassium iodide solution after which the liberated iodine is titrated with centinormal thiosulphate solution. Each mil of centinormal thiosulphate represents 0.2116 milligramme of iodine. The reactions on which this assay are based are: (a) Oxidation of nitrites and cyanides with permanganate in acid solution. (b) Reduction of the chlorates and bromates formed in (a) with sodium bisulphite. (c) Oxidation of the iodide to iodate by permanganate in alkaline solution; the chlorides and bromides being unchanged. (d) Liberating iodine in the cold by addition of potassium iodide and phosphoric acid; the bromides not being affected in the cold. Lasausse assays *copper iodide* by the following method: Exactly 400 milligrammes of powdered copper iodide are placed in a dry 250 mil separator, with stop-cock lubricated with glycerin instead of fat. Add 2 mils of solution of ferric chloride of the Codex (26 per cent.), shake during 10 minutes, when the iodine will be liberated. Add 20 mils of carbon disulphide and after shaking and separation, transfer the disulphide solution of iodine into a second separator. Repeat this ferric chloride, carbon disulphide treatment of the copper iodide twice. Mix the three carbon disulphide layers in the second separator, wash it well with water, then transfer it to a glass-stoppered flask, add to it a few grammes of potassium iodide and 10 mils of water and titrate with centinormal thiosulphate solution.

In a second suggested method the copper iodide is converted into potassium iodide and then into potassium iodate, which is then assayed as above.—J. pharm. chim., 20 (1919), 177, 181.

Iodides.—*New Volumetric Assay of.*—P. Godfrin liberates iodine from the iodide by treatment with potassium dichromate and hydrochloric acid and then titrates the liberated iodine with sodium thiosulphate V. S. As there are several side reactions, the assay yields false results unless sodium acetate is added to the reacting mixture. When this is done, satisfactorily accurate results are obtained.

With iodides, he dissolves 0.5 to 2 grammes of the solid in water to make 100 mils and if a liquid, he dilutes with water to about a

1 per cent. solution. In either case 10 mils of the solution are placed in a 250 mil Erlenmeyer flask, add 2 mils of 5 per cent. dichromate solution, 15 drops of hydrochloric acid and shake the mixture during 30 seconds. Then are added 20 mils of 10 per cent. sodium acetate solution, 50 mils of water and 2 mils of freshly prepared starch paste and lastly thiosulphate solution, drop by drop, until the blue color is discharged.

For iodides in urine, 10 mils of the urine are placed in the 250 mil flask, followed by 2 mils of freshly prepared starch paste, and enough 1 per cent. alcoholic solution of iodine to make a distinct blue color. Then the dichromate solution and the hydrochloric acid are added, after which the mixture is titrated with thiosulphate solution until the blue color is discharged.—J. pharm. chim., 19 (1919), 445.

Iodine Monochloride.—*Manufacture and Use as Antiseptic.*—Fourneau and Donard find that iodine trichloride is very unstable and therefore prefer iodine monochloride as a wound antiseptic. They prepare it as follows: Dissolve 100 grammes of iodine and 50 grammes of potassium iodide in the least possible amount of water and add this solution to 640 mils of Javel solution containing 77.7 grammes of available chlorine in 1 liter and then add gradually 180 mils of 29.57 per cent. of hydrochloric acid. Such a solution contains 0.20 gramme of iodine monochloride per mil. The final solution is prepared by mixing 5 mils of the original solution with 1 liter of 1 per cent. sodium chloride solution, the salt being used as a stabilizer. This solution is not entirely stable, decreasing strength after 72 hours in the ratio 67 : 42, and it is therefore advisable to make the final solution by using 7.5 or even 10 mils of the original solution to the liter.

Mestrezat and Casalis find that the above solution (1.50 grammes ICl to the liter) is not only an excellent antiseptic, but is absolutely devoid of caustic action.—Compt. rend. soc. biol.; through Chem. Abstracts, 13 (1919), 756.

Fluorides.—*Effect as Plant Fertilizer.*—Gautier and Clausmann report on experiments on the use of potassium fluoride as fertilizer. Seven plants (cress, cabbage, escholtzia, spinach, bugloss, asparagus and hemp) showed increased growth; three (convolvulus, onion and oats) were not affected at all; while three (sweet peas, chick peas and centaury) showed retarded growth.—Compt. rend.; through J. pharm. chim., 20 (1919), 135.

SULPHUR AND SELENIUM.

Sulphur.—*Administration in Oil Solution.*—At a meeting of the Société de Thérapéutique, Dr. Bourges recommended for rheumatism, both chronic and acute, intramuscular injections of sterile sulphurized oil, prepared by dissolving 1 gramme of sulphur in 100 grammes of sesame oil. He administered 5 mil doses every three days, then every five days and then every eight days until 8 to 12 injections had been given. In discussing the question, Dr. Huerre raised the question as to the preparation of a 1 per cent. solution of sulphur in oil. He stated he had been unable to do so by gentle heat and if the temperature is raised above 180° , while the sulphur dissolves, it is with the formation of an organic sulphur compound.—J. pharm. chim., 19 (1919), 415.

Sulphur.—*Camphor as Solvent for.*—Camphor is said to be an excellent solvent for sulphur and to increase its solubility in oils. Sulphur dissolves in 5 parts of melted camphor, yielding a yellow solution which congeals on cooling. This dissolves easily in vegetable oils with the aid of a very little heat; also in petrolatum oils.—Am. Drug., 67 (1919), 91.

Colloidal Sulphur.—*Relative Toxicity of.*—At a meeting of the Société de Biologie, B. G. Duhamel pointed out colloidal sulphur showing an attractive brown color is more toxic when administered hypodermically than were milky white samples. Rabbits injected with the brown samples respired hydrogen sulphide, whereas those injected with milky white samples showed no hydrogen sulphide in their breath.—J. pharm. chim., 20 (1919), 78.

Liquid Sulphur.—*Molecular Complexity of.*—A. M. Kellas has found that, contrary to the statements of various observers, the surface tension of liquid sulphur can be determined by means of capillary tubes between the melting point (115°) and the boiling point (445°). Impurities (especially sulphuric acid, sulphur dioxide, and hydrogen sulphide) must be previously removed. Sulphur can be purified by distillation and subsequent boiling in dry nitrogen, the gases evolved being pumped off. The mean value for five capillary tubes gave surface tensions of 60.46 and 56.38 dynes, respectively, for 119.4° and 156° . The molecular complexity of at least 95 per cent. of mobile sulphur (S_{λ}) between

115° and 160° is presumably represented by the formula S_6 , assuming the validity of the Ramsay and Shield method of calculation. The surface tension of viscous sulphur falls continuously from the melting point to the boiling point, being 48.2 dynes at 280° and 39.4 dynes at 445°. The molecular complexity alters about 160°, and it might be stated as a first approximation that an endothermic termolecular polymerization appears to occur near that temperature $3S_6 \rightleftharpoons (S_6)_3$. The aggregate S_{18} seems to be stable up to near the boiling point. The polymerization may be due to a tendency of sulphur to lower its valency with rise of temperature, the complex S_6 possessing a residual valency at 160°. Other methods of calculation of molecular complexity seem to emphasize the aggregate S_6 , but the results do not seem to accord with experimental averages as well as those of Ramsay and Shield's method.—J. Chem. Soc.; through Chem. News, 118 (1919), 47.

Sublimed Sulphur.—*Insolubility in Carbon Disulphide.*—A limit of insolubility of sulphur in carbon disulphide is suggested by "Abel Scholar," as this would permit of rapid estimation of the sulphur in compound licorice powder by ascertaining the per cent. soluble in carbon disulphide.—Chem. and Drug., 91 (1919), 590. (K. S. B.)

Hydrogen Sulphide.—*Substitute for.*—In analytic work, Bayer uses, instead of hydrogen sulphide gas, a solution of 10 grammes of sodium sulphide ($Na_2S \cdot 9H_2O$) in 50 mls of water and 50 mls of glycerin.—Pharm. Post; through Chem. Abstracts, 13 (1919), 1619.

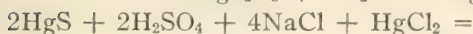
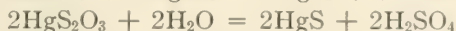
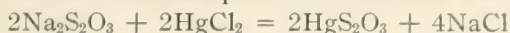
Sulphur-Oxygen Compounds.—*Simple Method for Distinguishing.*—A. Sander gives a very simple method for distinguishing the various sulphur-oxygen compounds by means of corrosive sublimate. The results tabulated are as follows:

Compound.	Action of $HgCl_2$ at ordi- nary temp.	Reaction of mixture on methyl orange.	Appearance of the solution after boiling.	Reaction of the solution after boiling.
Sulphate		neutral	unchanged	neutral
Sulphite		alkaline	precipitate	acid
Bisulphite		acid	precipitate	acid
Sulphide	precipitate	neutral	unchanged	neutral
Thiosulphate	precipitate	acid	unchanged	acid
Polythionate	precipitate	acid	unchanged	acid

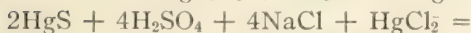
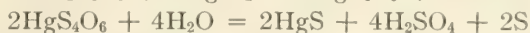
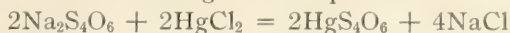
The reactions with the sodium salts can be explained as follows: In the case of sulphites a water-soluble complex compound, $\text{ClHg}(\text{SO}_3\text{Na})$, is formed from which on boiling calomel separates according to the equation:



Bisulphites form the same compound and hydrochloric acid. Sulphides give with mercuric chloride, mercury sulphide and sodium chloride. Mercury sulphide gives with mercuric chloride $2\text{HgS} \cdot \text{HgCl}_2$. In the case of thiosulphate the reactions are:



Polythionates react according to the equations:



Thiosulphate can be distinguished from polythionates by the properties of the former to be decomposed by sulphuric acid with the separation of sulphur and to decolorize iodine solution. Polythionates remain clear on addition of sulphuric acid and do not react with iodine.—Chem. Zeit.; through Pharm. Weekblad, 56 (1919), 1271. (H. E.)

Sulphides.—*Iodometric Assay of.*—I. M. Kolthoff in reviewing the various methods offered for estimating sulphides iodometrically found that the sulphur which separates and which according to Treadwell occludes iodine, is free from the halogen, because when the titration liquid is shaken with chloroform the latter is not colored violet. When the solution of the sulphide is rendered alkaline with sodium bicarbonate or any other weak alkali too much iodine is consumed because a part of the sulphide is oxidized to sulphate. The same is the case when the sulphide solution is added to an iodine solution which contains an excess of sodium bicarbonate. Good results are obtained by titrating the diluted neutral sulphide solution rapidly with iodine solution or adding the sulphide solution to a neutral or acid iodine solution until the latter is decolorized or finally adding the sulphide solution to an excess of a neutral or acid iodine solution and titrating back the excess of iodine. In every case only diluted sulphide solutions

should be used in the estimation. The writer further recommends oxidizing the sulphide by means of bromine. An excess of standardized potassium bromate solution is added to the diluted sulphide solution, followed by sodium bromide and hydrochloric acid. After allowing the mixture to stand for ten minutes potassium iodide is added and the liberated iodine is titrated with sodium thiosulphate solution. Each molecule of H_2S requires 8 equivalents of bromine for oxidation.—Pharm. Weekblad, 56 (1919), 1413. (H. E.)

Sulphurous Acid.—*Assay of.*—I. M. Kolthoff gives a review of the various methods employed for estimating sulphurous acid and sulphites. His experiments showed that in the iodometric estimation good results are obtained, when the solution under examination is added to an excess of volumetric iodine solution and the excess of iodine is titrated back. Similarly good results are obtained when titrating a measured quantity of volumetric iodine solution with the solution of sulphurous acid or sulphite. When, however, the latter solutions are titrated with iodine solution, too low results are obtained even in the presence of mannite or other substances which act as anticatalysts in the oxidation of sulphites by the oxygen of the air. These low results are not obtained, as claimed by Volhard, by the separation of sulphur. Potassium iodide acts as a positive catalyst in the oxidation of the sulphite by the oxygen of the air.—Pharm. Weekblad, 56 (1919), 1356. (H. E.)

Sulphuric Acid.—*Proposed Manufacture in Java.*—The mud of Lake Telga Bodas, Java, has been found to contain 80 per cent. of sulphur, and the Dutch Government proposes to erect a plant to manufacture sulphuric acid from this material.—Chem. and Drug., 91 (1919), 858. (K. S. B.)

Sulphates.—*Gravimetric Assay of.*—I. M. Kolthoff and E. H. Vogelenzang found that at ordinary temperature 2.3 mgm. of barium sulphate dissolve in one liter of water and that the solubility increases with increasing temperature. The solubility is also increased by the presence of nitric acid, but less than by the presence of hydrochloric acid, probably on account of the formation of $BaNO_3$ ions. No reduction takes place when the dry barium sulphate is ignited in a porcelain crucible, but the reduction is considerable when the ignition is carried out in a platinum crucible.

A reduction in a platinum crucible does not take place when the barium sulphate is ignited in a wet state. It is always advisable to add to the barium sulphate a few drops of sulphuric acid before ignition. Pregl claims that occluded salts can be washed out after ignition, but this claim is not valid, the occlusion of barium chloride, nitrate, calcium, ferric salts and potassium being a chemical one. The inaccurate results obtained in the presence of phosphates is due to the formation of barium phosphate. The authors finally arrive at the conclusion that it is impossible to give a general method for accurately estimating sulphates as barium sulphate in arbitrary mixtures. An exhaustive review of the literature on this subject is given.—Pharm. Weekblad, 56 (1919), 122. (H. E.)

The solubility of strontium sulphate at 19° is 19 mgm. in one liter of 25 per cent. alcohol, 120 mgm. in one liter of 50 per cent. alcohol and 0.1 normal hydrochloric acid and 40 mgm. in one liter of 50 per cent. alcohol and 0.1 normal ammonium chloride. The salt is insoluble in 50 per cent. alcohol. But even when using 50 per cent. alcohol the results are not satisfactory according to I. M. Kolthoff and E. H. Vogelenzang, because in the presence of salts errors are produced probably through the occlusion of strontium sulphate. The presence of hydrochloric acid gives too low results, the results being somewhat better when the acid solution is treated with sodium acetate. Ammonium salts are a disturbing factor, therefore the acid should not be neutralized with ammonia water. In the estimation of sulphates as strontium sulphate a general procedure for arbitrary mixtures cannot be given.—Pharm. Weekblad, 56 (1919), 159. (H. E.)

Sodium Thiosulphate.—*Test for Presence of Sulphates.*—The French Codex requires that in a 10 per cent. solution of sodium hyposulphite no precipitate should be formed on the addition of barium chloride solution. Labat reports that by this test misleading results are liable to be obtained because barium hyposulphite is formed, which, in the absence of sufficient water to hold it in solution, is deposited as a white precipitate. He, therefore, proposes the following tests: 10 mls of a 10 per cent. sodium hyposulphite solution are mixed with 0.5 ml of a 10 per cent. barium chloride solution, and the mixture is boiled for 6 seconds. If less than 0.3 per cent. of sodium sulphate is present the solution remains clear.—Bull. soc. pharm. Bordeaux; through Drug Circ., 63 (1919), 446.

Selenium.—*Presence in Vegetable and Animal Organisms.*—R. Britsch was unable to detect the presence of selenium in 35 samples of spinach, corn, clover, potatoes and bones. The method employed consisted in incinerating the plant in presence of sodium carbonate and sodium nitrite, and endeavoring to obtain any selenium present as a solution of selenous acid in concentrated sulphuric acid. In such solution, if selenium were present, it would be shown by the production of a green to bluish green color with codiene or an intense yellow color with colchicine. Experiments showed that 0.5 mg. of selenous acid could be detected in from 30 to 50 grammes of plant material by employing these tests. The author was also unable to definitely establish the presence of selenium in urine or in bones.—Zsch. physiol. chem.; through Chem. Abstracts, 13 (1919), 2047.

NITROGEN.

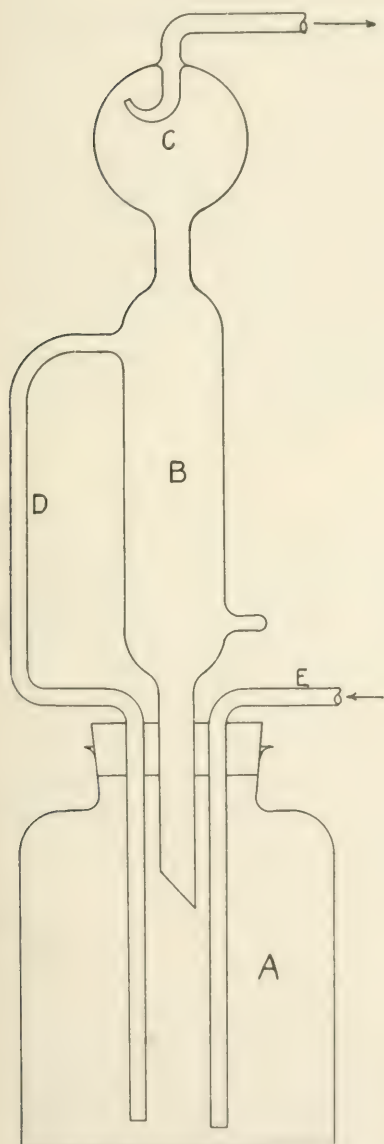
Nitrogen.—*Constitution and Structure of.*—H. Collins claims that the data which he gives prove the deduction by Rutherford that the nitrogen atom is disintegrated so as to produce two atoms of hydrogen and a mass of 12 when in collision with X particles.—Chem. News, 118 (1919), 29. (J. H.)

Nitrogen.—*Disruption of.*—In a lecture upon "Atomic Projectiles and Their Collisions with Light Atoms," Ernest Rutherford mentioned that when one of the alpha-particles emitted by radium C comes into contact with a light atom, as that of hydrogen, the atom is pushed on a certain distance, a heavier atom being moved a less distance. When he tried the experiment upon nitrogen, a few atoms were found to go as far as hydrogen atoms, and as the possibility of the presence of external hydrogen was avoided by precautions, the lecturer was led to the conclusion that the atom of nitrogen was disrupted, and that the nucleus of the nitrogen atom is composed of three atoms of helium and two of hydrogen.—Chem. and Drug., 91 (1919), 592 (K. S. B.)

F. H. Loring reports a discussion by Sir E. Rutherford in which the latter states that it is difficult to avoid the conclusion that in collision with α -particles, nitrogen atoms are disintegrated into

hydrogen atoms or atoms of mass 2 of which must have formed a constituent part of the nitrogen nucleus.—*Chem. News*, 118 (1919), 311. (J. H.)

Fig. 30.



Nitrogen Generator.

Nitrogen.—*Generator for Laboratory Use.*—W. L. Badger describes an apparatus (Fig. 30) for removing oxygen from air or commercial nitrogen, in order to obtain a very pure supply of nitrogen.

The apparatus is filled with metallic copper in the form of wire, and filled with a reagent made by diluting commercial ammonia with equal part of water and saturating this mixture with ammonium chloride.

The air is passed through the bottle containing the reagent, where it loses most of its oxygen, the last trace being lost in the tower, and the gas issuing from the apparatus is very pure nitrogen when washed to free it of ammonia.—*J. Ind. Eng. Chem.*, 11 (1919), 1052. (L. A. B.)

Nitrogen.—*Production from Air in the United States.*—There has been erected at the United States Department of Agriculture experiment farm at Arlington, Virginia, the largest experimental plant in the United States for the production of nitrogen from air. The Haber process is being used.—*Chem. and Drug.*, 91 (1919), 86. (K. S. B.)

Nitrogen.—*Replacement in Soil.*—G. T. Morgan states that the nitrogenous compounds formed by the electrical discharges of thunderstorms and subsequently washed onto the soil by rain amount to 11 lbs. per acre in temperate climates, and exceed this greatly in the tropics.—Chem. and Drug., 91 (1919), 1236. (K. S. B.)

Nitrogen Compounds.—*Production of.*—J. P. Montgomery. The author reviews the various "natural" and synthetic methods of the manufacture of ammonia and nitric acid, stating that in spite of the large amounts being made by synthetic methods coke will continue a very important source of ammonia and that large amounts of Chili saltpetre will be used in the manufacture of concentrated nitric acid, it being cheaper to use it and sulphuric acid than to concentrate the dilute acid obtained by synthetic methods.—Chem. News, 118 (1919), 162, 173. (J. H.)

Ammonia.—*New Method of Synthesis.*—Hampel and Steinau report a new method for the synthesis of ammonia which consists in heating together iron, ammonium chloride and nitrogen at 300° under 50 atmospheres pressure. The reaction proceeds under the equation: $3\text{Fe} + 6\text{NH}_4\text{Cl} + 2\text{N} = 3\text{FeCl}_2 + 8\text{NH}_3$. The gaseous mixture obtained contains 98 to 99 per cent. NH_3 ; of this, 75 per cent. comes from the ammonium chloride and 23 to 24 per cent. from the nitrogen. The ammonia may, subsequently, be passed into the ferrous chloride solution whereby ammonium chloride is again formed together with ferrous hydroxide which may be reduced to the metallic state and used again.—Chem. Ztg.; through Pharm. Era, 52 (1919), 100.

Ammonium Sulphate.—*New Method of Manufacture.*—The manufacture of ammonium sulphate without the use of sulphuric acid has been tried in England. The ammonia in gas is fixed by use of the sulphur in the coal consumed. The gas is washed and then treated with a solution of zinc sulphate, when zinc sulphide is precipitated and ammonium sulphate recovered from the solution. The zinc sulphide is converted again to sulphate.—Chem. and Drug., 91 (1919), 936. (K. S. B.)

Nitrogen Dioxide.—*Reaction with Water.*—A. Sanfourch states that while the reaction which is generally supposed to take place between nitrogen peroxide and water can be represented by the equation $3\text{N}_2\text{O}_4 + 2\text{H}_2\text{O} = 4\text{HNO}_3 + 2\text{NO}$, his study of the velocity of oxidation of nitrogen dioxide suggests that nitrous anhydride may play some part in the reaction, and this hypothesis can be verified by bringing into intimate contact vapor of nitrogen peroxide mixed with an excess of air and water or more or less diluted nitric acid. The experiments show that in the oxidation of nitrogen dioxide in presence of water nitrous anhydride is the intermediate product and not nitrogen peroxide. Nitrous anhydride is oxidized by nitric acid of sufficient concentration with formation of nitrogen peroxide and water; this reaction is limited by the inverse reaction. Thus there must be equilibrium for a certain concentration of nitric acid, and experiments show that this concentration is in the neighborhood of 50 per cent.—*Compt. rend.*; through *Chem. News*, 118 (1919), 179.

PHOSPHORUS.

Phosphorus Metabolism.—The more recent investigations on digestion and absorption all point to the probability that phosphorus from the digestive tract reaches the general circulation only in the form of inorganic phosphates and that all organic phosphorus compounds are synthesized in the body cells. This is in support of the conclusion of the Council on Pharmacy and Chemistry in forming an estimate of the therapeutic potency ascribed to preparations of organically bound phosphorus, such as lecithin, glycerophosphates, phytin, nucleic acid and phosphoproteins. All the newer researches give no indication that the body is dependent on a ready-made supply of phosphatid (phosphorized fat) in the diet to maintain normal nutrition.—*J. Am. Med. Assoc.*, 72 (1919), 1294. (W. A. P.)

Phosphorus.—*Manufacture in Japan.*—Three Japanese chemical concerns have recently successfully produced phosphorus, the average output being about 100 lbs. per month. The normal Japanese consumption is about 3,000 tons annually, most of which will probably be produced at home in the near future.—*Chem. and Drug.*, 91 (1919), 5. (K. S. B.)

Hypophosphites.—*Assay of.*—J. L. Dickerson and J. P. Snyder have found the U. S. P. assay for hypophosphites uniformly unsatisfactory, due, they believe, to incomplete oxidation to phosphate and unavoidable mechanical loss. Oxidation by means of nitric acid and potassium permanganate and precipitation with ammonium molybdate and magnesia mixture gives fair results but the method is tedious and requires great care. They have devised a method which depends on the fact that a solution of mercuric chloride reduces an equivalent amount of calomel. To the precipitated calomel, an excess of iodine is added followed by titration with sodium thiosulphate. Below are the detailed directions:

“One gramme of the hypophosphite, which has been previously dried to constant weight in a desiccator over sulphuric acid, is accurately weighed and transferred to a 200 mil volumetric flask and made up to the mark with distilled water. When the salt has completely dissolved and the solution has been thoroughly mixed, 20 mils are pipetted into an Erlenmeyer flask of about 300 mils capacity, 20 mils of hydrochloric acid added, followed by 40 mils of mercuric chloride solution. The flask is placed upon the steam-bath and allowed to remain there with occasional shaking for one hour or until the precipitated mercurous chloride is settled and the supernatant liquid is clear. The solution is filtered, the calomel collected upon a 11 cm. filter paper and washed well with distilled water. The filter paper and contents are transferred to the flask in which precipitation was made, 3 to 4 grammes of potassium iodide added and 50 mils of N/10 iodine (75 mils in the case of ammonium hypophosphite). Stopper the flask and let stand for about one-half hour, with occasionally shaking. The excess of iodine is now treated with N/10 sodium thiosulphate, starch solution as the indicator. 1 mil. of N/10 iodine is equivalent to:

Manganese hypophosphite.....	0.002538 gramme
Ammonium hypophosphite.....	0.002077 gramme
Calcium hypophosphite.....	0.002127 gramme
Sodium hypophosphite.....	0.0026517 gramme
Potassium hypophosphite.....	0.002604 gramme

Heating the mixed solutions insures precipitation of all the calomel and steam bath heat does not reduce any to metallic mercury. Reheating the filtrate is also a check upon complete precipitation. Washing the precipitate with distilled water or diluted hydrochloric acid shows no perceptible difference in results. The mer-

curic chloride solution is made by dissolving 5 grammes of the U. S. P. salt in cold distilled water and filtering. When a standard mercuric chloride solution is used and what remains determined electrolytically, excellent results are obtained. Doubtless residual mercuric chloride could be estimated volumetrically also.—J. Am. Pharm. Assoc., 8 (1919), 99. (Z. M. C.)

BORON.

Boric Acid.—*Assay of.*—Jannasch and Noll recommend titrating boric acid with standardized sodium alcoholate solution and adding glycerin in order to prevent dissociation.—J. prakt. chem.; through Drug. Circ., 63 (1919), 382.

Boric Acid.—*Use as a Disinfectant.*—Tanner and Funk give an account of some carefully conducted experiments showing the effect of this agent on a number of bacteria. A saturated solution of boric acid in distilled water was used and tubes of dextrose agar were inoculated and incubated. The result showed that very little if any germicidal action followed the use of even large amounts of boric acid. Further experiments were made using the silk thread method of inoculation, which also gave a very poor result, and the general conclusion of the authors is that the use of this reagent should be discontinued in those cases where disinfection is absolutely essential.—Chem. News, 118 (1919), 263.

. CARBON AND SILICON.

Carbon.—*Allotropy of.*—M. Copisawow, regarding the carbon molecule as being polyatomic, suggests the allotropic forms are due to: (1) a *non-rigid* molecular configuration, some valencies of which are *free*; (2) a *rigid* configuration, some valencies of which are *free*; (3) a *rigid* configuration, all valences of which are *fixed*. Thus according to theory we would expect to find three allotropes of carbon which agrees with the facts. The amorphous form is represented by class (1), none of the atoms are *rigid*; graphite is placed in class (2), atoms *rigid* but some valencies *free*; the diamond is placed in class (3), *all* atoms are *rigid* and *all* valencies fixed. Deductions based upon experiment and theories are given.—Chem. News, 118 (1919), 301. (J. H.)

Charcoal.—*Swedish.*—J. W. Beckman states that the superior quality of the charcoal used is responsible for the excellent characteristics of Swedish iron.

The charcoal is derived in Sweden from three sources the principal sources being pit charcoal, produced in the forests, and from lumber waste, and from by-product ovens. All the charcoal made in Sweden is from soft wood and a bushel weighs about 14 lbs. In 1915 charcoal to the amount of 636,000 tons was produced, valued at \$15,900,000. The by-product ovens gave, in 1914, charcoal 7.1 million bushels.

Tar.....	6122 tons
Heavy tar.....	180 tons
Wood oil.....	201 tons
Wood alcohol.....	524 tons
Turpentine.....	297.5 tons
Formaldehyde.....	227 tons
Acetate lime (80%).....	917 tons
Acetone.....	5.5 tons
Creosote oils and various other products.....	53 tons

—J. Ind. Eng. Chem., 11 (1919), 1063. (L. A. B.)

Dorsite.—*An Activated Charcoal.*—In preparing charcoal for use in gas masks the hydrocarbon impurities were oxidized by passing air or steam over the screened charcoal, exposure to steam at 900° for one hour giving best results. This activated charcoal was called "dorsite." It is suggested that, because of its increased absorptive power, it may be of use in medicine and as a filtering agent.—Chem. and Drug., 91 (1919), 574. (K. S. B.)

Water-Glass.—*Manufacture of.*—According to O. Maltz water-glass is best prepared by melting intimate mixtures of either 100 parts of sand, 75 parts of sodium sulphate and 8 parts of charcoal or 100 parts of sand and 52 parts of sodium carbonate at about 1500° and pouring the molten mass into vats containing a small quantity of water by which the mass is chilled and rendered brittle. It is then reduced to small pieces and dissolved by steam.—Chem. Ztg.; through Pharm. Weekblad, 56 (1919), 980. (H. E.)

METALS.

ALKALIES.

Alkalies.—*Electrolytic Production from Sea Water.*—It is proposed in Norway to produce salt from ocean water by electricity, \$2,750,000 having been secured to put the plan into operation. It is expected that a yearly production of 100,000 tons of salt will yield also 2,500 tons of pure potash, 342 tons of bromine and considerable quantities of magnesium salts, Glauber's salt and gypsum. The interesting feature of the new works is that the whole process will go on automatically from the time that the ocean water is pumped into the reservoirs until the salt comes out in certain quantities and different qualities. To produce this amount of salts will require not more than 70 people whose principal work will be to attend to the machines.—*Nat. Drug.*, 49 (1919), 139. (C. M. S.)

Alkalies.—*South African Deposits of.*—A rich discovery of sodium carbonate, potash and other alkalies is reported from the vicinity of Klerksdorp, South Africa.—*Chem. and Drug.*, 91 (1919), 856. (K. S. B.)

Potash.—*Deposits in Alsace.*—With the cession of Alsace-Lorraine to France, Germany loses the rich potash deposits of Alsace, and with them the potash monopoly of the world. The potash deposits extend 9.94 miles to the north of Mühlhausen, over a surface of more than 69.2 square miles. They are unusually rich in potash salts, much richer, in fact, than the beds in the interior of Germany. They are, moreover, easier to exploit. Their thickness ranges from 12.1 to 17.7 feet. The thickness of the smaller beds in the upper layers varies from 2.6 to 4.9 feet.

The first workings were begun in 1909; in 1913 there were twelve in operation. In a period of only three years the production rose from 42,420 to 287,000 metric tons, so that the production of potash in Alsace in 1913 was already one-fifth of the entire German output. The total capital invested in the potash works of Alsace amounted to \$8,187,200. The production of these workings, it is calculated, would supply the world's requirements of potash for 250 years on the basis of the consumption in the past pre-war

year. According to estimates, the quantity of potash salts in Alsace amounts to nearly 1,500,000,000 metric tons, from which several hundred million tons of pure potash can be extracted.—*Am. Drug.*, 67 (1919), 427.

Potash.—*Production in Germany.*—The German Potash Syndicate produced 10.02 million centners of pure potash in 1918, compared to 10.942 million in 1917.—*Chem. and Drug.*, 91 (1919), 213. (K. S. B.)

Potash.—*Production in Tunis.*—Bourguignon states that when German sources of potash and bromine were cut off, and the need of the former for agriculture and of the latter for gas warfare became urgent, the French Government was able to exploit the natural saline deposits and salt marshes existing in their North African colony. Works were started and have now been long in successful operation; one alone, constructed by the Tunisian Government, is capable of dealing with 50,000 tons of sebkainite, converting it into potassium chloride equivalent to 22 to 23 per cent. of potash. The chief source of supply of raw material is the dried salt lake near Zarzis, which, under a crust of salt, gives water of the sp. gr. 1.218, containing, per liter, 158 grammes of sodium chloride, 22 grammes of magnesium sulphate, 141 grammes of magnesium chloride, 13 grammes of potassium chloride, and 2.24 grammes of magnesium bromide. Tunis is now quite independent of outside sources for its needed supply of potash fertilizers. Incidentally it can also supply its own needs for mineral phosphates.—*Rev. Sci.*; through *Pharm. J.*, 103 (1919), 234.

Potash.—*Production in the United States.*—The U. S. Geological Survey reports interestingly on the war-time production of potash from kelp, from blast furnace and cement plant flue dust, from certain alkali lakes and from certain potash minerals.—*Am. J. Pharm.*, 91 (1919), 157. (J. K. T.)

Potash.—*Production Possibilities in Italy.*—A commission under the direction of the Ministry of Arms and Munitions is investigating the following possible sources of potassium salts in an effort to find a supply in Italy sufficient for home consumption: (1) flue dust of metallurgical furnaces; (2) flue dust of cement kilns; (3)

the residue left after the evaporation and calcination of molasses or of the oily dregs of pressed olives; (4) the grease extracted from wool; (5) the ashes of marine plants; (6) the salt waters of Italy and her African colonies; (7) the double silicates of aluminum and potassium occurring in rocks which are found abundantly in the central and southern parts of the peninsula.—Chem. and Drug., 91 (1919), 190. (K. S. B.)

Potash.—*Production from Water Hyacinth.*—Under the supervision of the Superintendent of Agriculture, the manufacture of potash from the water hyacinth was recently undertaken in Bengal as an experimental measure. The ash was obtained at a nominal price, and gave a good yield of potash.—Chem. and Drug., 91 (1919), 624. (K. S. B.)

Potassium.—*Assay with Cobaltic Nitrite.*—On account of the high price of platinic chloride, Garola and Braun recommend the use of cobaltic nitrite as a precipitant for potassium. The reagent consists of a solution of 28.6 grammes of cobaltic nitrite and 50 mls of glacial acetic acid in sufficient water to obtain 500 mls, and a 36 per cent. aqueous solution of sodium nitrite. The solutions are kept separately, equal volumes are mixed two hours before use and any precipitate formed is allowed to settle. For estimating the potassium the solution under examination is treated with a slight excess of sodium carbonate solution, to precipitate alkaline earths, etc., then evaporated to a small volume (10 to 25 mls), acidulated with acetic acid and mixed with the reagent, using for 250 milligrammes of potassium chloride in 25 mls of liquid 40 mls of the reagent. If less potassium is present more of the reagent should be used, for instance, 5 mls for 10 milligrammes of potassium chloride in 10 mls of liquid. The mixture is allowed to stand over night, the precipitate is collected in a Gooch crucible, washed with water, acidulated with acetic acid and then with alcohol. The precipitate is dried at 100° to constant weight. The weight multiplied by 0.2074 gives the amount of potassium oxide. With slight modifications, the method can be applied for the estimation of potassium in fertilizers, soils, etc.—Drug. Circ., 63 (1919), 145.

Potassium.—*Assay with Perchloric Acid.*—This assay has the great advantage of economy; 3 cents worth of perchloric acid

replacing \$8.00 worth of platinic chloride. The Scholl method of assay is accurate within 0.1 to 0.5 per cent.—Chem. Analyst; through Chem. Abstracts, 13 (1919), 293.

Potassium Carbonate.—*Salt of Wormwood as Synonym.*—It appears that wormwood salts as a name for potassium carbonate is not entirely obsolete, at least in England, and the reason for this is that wormwood was formerly one of the principal sources for this product. Quincy, speaking of wormwood, describes "its pungent and almost caustic salt, so hurtful to the nerves of some dry constitutions." The following brief history of its introduction into pharmacy may also be of interest: When the salt was first introduced into the Edinburgh Pharmacopœia it was under the name "sal fixum absinthii," and the process of extracting it from the leaves of wormwood was given. In 1788 it appeared in the London book under the name "kali præparatum," which in 1809 was changed to "potassæ subcarbonas."—Am. Drug., 67 (1919), 218.

Potassium Iodide.—*Elimination of.*—At a meeting of the Société de Biologie, Ameuille and Sourdél pointed out that after administration of potassium iodide it is eliminated in almost definite ratio in the urine and the saliva. It had been considered that when there was urinary suppression, the salivary elimination would be increased, but the authors' experiments show that when the elimination in the urine is lessened a similar lessening occurs in the salivary elimination.—J. pharm. chim., 19 (1919), 460.

Potassium Iodide.—*Japanese Export.*—The Japanese exports of potassium iodide for the past three years were as follows: 1916, 166,473 kin; 1917, 165,403 kin; 1918, 184,950 kin.—Chem. and Drug., 91 (1919), 364. (K. S. B.)

Potassium Nitrate.—*Chilean Production.*—The "Blanco Encalada" plant at Antofagasta produces 2 tons of crystalline potassium nitrate every 24 hours from saltpeter mother liquors. A freezing-out process is used, the crystals being obtained by centrifuging, washing and recrystallization.—Bol. soc. foment. fabric; through Chem. Abstracts, 13 (1919), 2257.

Soda Ash.—*Production in Canada.*—The Brunner, Mond, Canada, Ltd., have their new plant at Amherstburg, Ont., prac-

tically completed, and they are in a position to supply Canadian requirements. They are using the "Solvay Process," by which practically all the soda-ash now produced is made. The town of Amherstburg is well situated, and the raw products—salt, limestone, and ammonia—are easily available. A tract of land of 650 acres was secured, and a main building, 170 by 190 feet and ten stories high, was erected. The plant has one of the largest lime kilns known, being 80 feet high. Taken altogether, it is one of the most complete soda-ash plants in the world, and is designed in such a way that the capacity may be readily increased with the demand. The company produces its own power, and obtains its salt from wells practically at the plant. The limestone used is also taken from quarries on the property. The produced soda-ash is of general use in the manufacture of glass, soap, paper, wood-pulp, paints, leather, enamelled ware, cleaners, textiles, oil refining, metal working, and metallurgical operations, washing powders, chemicals, and drugs.—Chem. News, 118 (1919), 178.

Sodium Sulphate.—*History of.*—Glauber's salt (sodium sulphate) was first introduced into the Edinburgh Pharmacopœia (in this, as in many cases, the pioneer) in 1735, under the name *Sal Mirabile Glauberi*, the *Spiritus Glauberi*, of which it was the residuum, being included in the same edition. This was distilled from a mixture of sea water and oil of vitriol. In 1746 the London Pharmacopœia followed suit, naming the salt *Sal Catharticus Glauberi*—a title changed in 1788 to *Natron Vitriolatum* and in 1809 to *Sodæ Sulphas*. Epsom salt first appeared in the London Pharmacopœia in 1746, under the name *Sal Catharticus Amarum*, changed in 1788 to *Magnesia Vitriolata*, and in 1809 to *Magnesia Sulphas*.—Pharm. Era, 52 (1919), 263.

Sodium Sulphate.—*Hypodermic Use in Chronic Constipation.*—M. Belaunde strongly advocates the treatment of habitual constipation by the hypodermic administration of sodium sulphate, according to the method of Martinez. The injection is a 25 per cent. w/v sterile solution of the salt in water. Of this, 2 mils are injected hypodermically into the arm daily for ten or twelve consecutive days, or until the stools become fluid; the treatment is then discontinued. The tendency to constipation seems to be permanently cured. If the series of injections is interrupted for any reason, it has to be recommenced again from the first in-

jection. No saline or other purges must be allowed during the course or afterwards. In the author's experience the treatment has never failed if conscientiously carried out, although some cases required thirty to forty injections.—Arch. esp., Enf. Ap. Digest; through Pharm. J., 103 (1919), 142.

CALCIUM AND BARIUM.

Calcium.—*Quantitative Separation from Magnesium.*—Winkler has found that when separating calcium from magnesium in the presence of sodium salts or sulphates, too high results are obtained. He therefore proposes the following method by which a contamination of the precipitate with sodium or sulphate is eliminated. In 100 mls of the solution containing not more than 0.1 gramme of calcium and 0.05 gramme of magnesium, 3 grammes of ammonium chloride are dissolved, and after the addition of 10 mls of normal acetic acid the solution is boiled and is then treated with 20 mls of 2.5 per cent. ammonium oxalate solution. The mixture is allowed to stand for 18 hours, the calcium oxalate is collected and weighed, and in the filtrate the magnesium is determined by the ammonium-magnesium method.—Z. angew. Chem.; through Drug. Circ., 63 (1919), 146.

Calcium Carbide.—*Production in Silesia.*—A large electric works with a capacity of 25,000 kw. has been erected during the war at Katlowitz, Silesia, close to the Polish frontier. It supplies power to a carbide factory which is now running regularly and has an annual output of 20,000 tons. This enterprise uses coal from the Prince-Pless mines. The directors of these mines have also come to an agreement with the metallurgical firm of Beer, Sonderheimer and Co., Frankfurt, for the formation of a company to unite the mines with a smelting works. The new factory will run the carbide factory and the electrical power works. The capital will be \$200,000 and the shares will be held exclusively by the two companies and no bank will participate in the flotation.—Oil Color Trade J.; through J. Ind. Eng. Chem., 11 (1919), 591.

Barium Sulphite.—*Poisoning by.*—Two separate fatal cases of poisoning by barium sulphite have occurred in Australia. One took place in November, when a patient for whom barium sulphate was prescribed in a barium meal, for diagnostic purposes, at Sydney Hospital, died after partaking thereof. Barium sulphite was found

in the powder, the porridge, and the contents of the stomach. The second case occurred more recently, when a patient at Lidcombe, N. S. W., Government Asylum, succumbed after a similar treatment. It was found in this case that the drug as sold was originally sulphite, but with age it had partially been oxidized to sulphate. It is suggested that the original stock may have been barium sulphite, erroneously shipped to Australia as sulphate.—*Australasian J. Pharm.*; through *Pharm. J.*, 102 (1919), 389.

RADIUM AND URANIUM.

Radium.—*Effects of Irradiations from.*—Kailan submitted chloroform and carbon tetrachloride to the action of radium irradiation for a period of three years, light being excluded. He found that in the chloroform 0.5 per cent had been affected, hexachlorethane being formed, while in the case of carbon tetrachloride chlorine and hydrochloric acid had formed from the phosgene produced, the alteration amounting to 0.75 per cent.—*Z. angew. Chem.*; through *Chem. and Drug.*, 91 (1919), 1506.

Radium.—*Use in Arthritis Deformans.*—It has been claimed that radium emanation is of value in all forms of non-suppurative, acute, subacute and chronic arthritis (syphilitic and tuberculous excepted), in chronic muscle and joint rheumatism (so-called), in arthritis deformans, in acute and chronic gout, etc. Its chief value is in the relief of pain. Curative results seem to be lacking.—*J. Am. Med. Assoc.*, 72 (1919), 1245. (W. A. P.)

Uranium.—*An Industrial Poison.*—The increasing production of uranium oxides and salts, either as direct or by-products in industrial processes, has directed attention to the possible occurrence of industrial poisoning from this source. The soluble salts of uranium are well known to be actively toxic, giving rise to nephritis, and the harmful action on the kidneys appears to be cumulative. The chief source of danger appears to be the dust of the uranium oxides. If these are inhaled, although they are insoluble in water, it is known that they will produce toxic results. Probably they are dissolved in the gastric secretion. A protest is raised against the inclusion of uranium nitrate in the U. S. P. IX. It is considered that there is insufficient evidence of therapeutic value to justify the official recognition of this poisonous salt. It has

been used without adequate justification for the treatment of diabetes and cancer. Its solutions are poisonous, and when injected, subcutaneously, even in small doses, they produce glycosuria. Recent work by Kasner, Reimann and Brookes has fully established the active toxicity of uranium oxides, and should lead to the omission of its salt from the next edition of the U. S. P.—J. Am. Med. Assoc.; through Pharm. J., 103 (1919), 186.

COPPER.

Copper.—*Assay of.*—Kolthoff gives the following method for assaying copper: To the copper solution are added 10 mls of a 0.2 per cent. potassium iodide solution, 5 mls of 20 per cent. sulphuric acid and 10 mls of a 10 per cent. potassium sulphocyanide solution. The liberated iodine is then titrated with N/10 sodium thiosulphate solution. The method may be used for the determination of the excess of copper in sugar determinations and in this case the cuprous oxide need not be separated. It is necessary, however, that the acid and sulphocyanide be added immediately one after the other in order to prevent oxidation of the cuprous oxide. Copper may be determined in the presence of ferric salts provided that the mixture is first treated with sodium pyrophosphate solution.—Chem. Ztg.; through Drug Circ., 63 (1919), 381.

Copper.—*Test for.*—When a liquid containing copper is acidulated with hydrochloric acid, an excess of zinc sulphate added and the mixture then treated with potassium ferrocyanide a blue precipitate is formed after a few minutes, when as little as 0.0002 gramme of copper is present. The color of the precipitate is more pronounced than when zinc is absent. Demoussy and Maquenen have utilized this test for detecting copper in vegetable ashes or soils, taking for the experiment 0.1 gramme of the former and 5 grammes of the latter.—L'Union pharm.; through Drug. Circ., 63 (1919), 330.

Copper.—*Test with Hematoxylin.*—Rebello-Alves and Benedicenti report that when a freshly prepared solution of hematoxylin is added to a diluted copper solution an intense blue color is produced and a blue sediment separates on standing. The reaction is claimed to be more sensitive than that given with ammonia.—Arch. Farm. Sperim.; through Drug. Circ., 66 (1919), 329.

Copper-Mercury Iodide.—*Use of.*—Copper-mercury iodide, which has a vermillion color at ordinary temperatures and turns black when heated, is used as a detector for the overheating of bearings.—Chem. and Drug., 91 (1919), 842. (K. S. B.)

Copper Sulphate.—*Use as Polisher.*—Copper sulphate increases the brilliancy of black lead as a polisher.—Chem. and Drug., 91 (1919), 1143. (K. S. B.)

Copper Sulphate.—*Use in Skin Troubles.*—The use of this old remedy has been revived with considerable success for a number of skin diseases, which are enumerated by De Herain. It is employed in the following forms: *Stronger Ointment.*—Copper sulphate, 2; zinc oxide, 15; wool fat 10; petrolatum, to make 100. Dissolve the copper sulphate in a little water, and incorporate with the wool-fat; then add the other ingredients. *Weaker Ointment.*—As above, but using only 0.2 Gm. of copper sulphate. *Stronger Dusting Powder.*—Copper sulphate, 2; French chalk, 98. Mix. *Weaker Dusting Powder.*—Copper sulphate, 0.2; French chalk, 99.8. Mix.—L'Union pharm.; through Pharm. J., 103 (1919), 296.

Cupric Hydroxide.—*Solubility in Caustic Alkalies.*—It is generally claimed that cupric hydroxide is soluble in caustic soda and caustic potash solutions only in the presence of certain organic substances, such as tartaric acid, etc. J. Müller found that cupric hydroxide is soluble in these liquids without the addition of organic substances. Caustic potash solution (sp. gr. 1.453 to 1.498) and caustic soda solution (sp. gr. 1.345 to 1.370) dissolve copper in the proportion of 780 mgm. per 100 mils. The solutions are colored blue and do not change their color on heating. Compt. rend.; through Pharm. Weekblad, 56 (1919), 980. (H. E.)

Cuprous Oxide.—*Manufacture of.*—L. Moser prepares yellow cuprous oxide by the reduction of Cu^{++} ions in presence of OH^{-} ions by means of hydroxylamine hydrochloride, and the electrolytic method, using a pure copper anode and alkali sulphate as electrolyte. The light yellow product which is first precipitated is very probably cuprous hydroxide, which spontaneously gives up water at a low temperature and is converted into the reddish yellow hydrated cuprous oxide which is amorphous. The dry yellow cuprous oxide is quite stable in air, but it shows a tendency to pass very slowly

into the crystalline form. This very slow process can be hastened by heating the amorphous product in absence of air. The yellow cuprous oxide must thus be regarded as the primary metastable form which shows a tendency to pass into the metastable red crystalline modification.—Z. anorg. Chem.; through Chem. News, 118 (1919), 215.

Brass Paste.—*Use in Tuberculosis.*—Ellis gives a résumé of his researches, and the results achieved, with the use of brass in cutaneous and other forms of tuberculosis. His "brass paste" is formed by combining 86 per cent. of basic copper sulphate with 14 per cent. of basic zinc sulphate. This paste is easily applied; it is quite innocuous to healthy tissue, and can be placed in the eye without causing other than temporary irritation—in fact, its application to the conjunctiva of the everted eyelid resulted in the removal of all tuberculosis tissue in a case of over twenty years' duration. It was found that this "brass paste" did not reach the deeper deposits, and for these conditions a fluid preparation called "brass oil," or, shortly, "bro," is applied on gauze covered with jaconet and left on from two to seven days. Further investigation showed that the picric acid series had a distinct action in controlling swellings produced by lymphatic obstructions, the result of tuberculosis invasion. This observation led to the addition of approximately 1 per cent. of picric acid to both brass paste and oil. The lighting-up of phlyctens must always cause temporary discontinuance of the treatment; they may be treated by a dilution of picric acid bro one part to cod-liver oil three parts.—Lancet; through Chem. and Drug., 91 (1919), 483.

Silver.—*Recovery from Organic Silver Solutions.*—Solutions of organic silver preparations, such as albumose-silver protargol, etc., are used in rather large quantities for irrigating purposes and the excess of solution which is not used is generally discarded. G. Maue reports on a number of experiments carried on in order to recover the silver from such solutions and found the following method very convenient for this purpose: 360 liters of liquid containing about 450 grammes of albumose-silver were acidulated with 60 grammes of concentrated sulphuric acid previously diluted with 200 mls of water and to the liquid ammonium sulphocyanate solution (1 : 2) was added until a few drops of the mixture gave no longer a red color when mixed with ferric alum solution slightly acidulated with nitric acid. After allowing the precipitate to

subside, it was collected on a filter and fused with soda-salt-peter mixture in the usual way. Thus 35 grammes of silver at a cost of about 6 cents were recovered. Other methods were tried on an albumose-silver solution containing 8.02 per cent. of silver and the following results were obtained:

Method.	Per cent of silver recovered.
Grape sugar and caustic soda.....	49.12
Milk sugar and caustic soda.....	100.26
Tannic acid.....	99.99
Ferrous sulphate.....	97.57
Ferrous sulphate and sulphuric acid.....	76.04
Potassium permanganate and nitric acid.....	74.51
Potassium permanganate.....	55.19
Hydrochloric acid.....	99.35
Potassium bromide and sulphuric acid.....	99.59
Potassium iodide and sulphuric acid.....	98.92
Potassium sulphocyanate and nitric acid.....	99.45
Potassium ferrocyanide and acetic acid.....	99.60

Chem. Ztg.; through Pharm. Weekblad, 56 (1919), 889. (H. E.)

Gold.—*Orthotolidine as Colorimetric Test for.*—W. B. Pollard finds that one part of gold (as gold chloride) in 1 million parts of water gives a bright yellow coloration when treated with a 0.1 per cent. *o*-tolidine solution in 10 per cent. hydrochloric acid; with a solution containing 1 part of gold in 20 million the yellow coloration can just be detected in a depth of 10 Cm. of liquid. Ferric salts, ruthenium, osmic acid, and vanadic acid also give a yellow coloration with the reagent, but the following metals, when present as chlorides, do not react: aluminium, antimony, barium, bismuth, cadmium, calcium, chromium, cobalt, copper, iridium, lead, magnesium, mercury, manganese, nickel, platinum, rhodium, sodium, strontium, tin, uranium, and zinc. The solution to be tested should be free from nitrous acid and reducing substances. If copper is present a green coloration is obtained instead of pure yellow.—*The Analyst*; through J. Soc. Chem. Ind., 38 (1919), 269A.

MAGNESIUM.

Magnesium Salts.—*Assay of.*—Bruckmiller calls attention to the following rapid method for determining magnesium. The

solution of the magnesium is made alkaline with ammonia water, placed in ice water and, after the addition of an excess of ammonium phosphate, the mixture is stirred vigorously until the magnesium is precipitated. After the addition of 10 mils of ammonia water, the precipitate is collected on a filter and washed with 3 per cent. ammonia water. It is then rinsed into a beaker, water is added and the mixture is boiled until the ammonia is expelled. Finally, the precipitate is estimated by titration with N/10 hydrochloric acid solution, using methyl orange as indicator, each mil of hydrochloric acid corresponding to 0.0012 gramme of magnesium. (This method, which is not a new one, can be used with slight modifications for the rapid determination of magnesium in milk of magnesia or effervescent citrate of magnesia. The precipitation of the ammonium-magnesium phosphate can also be effected by shaking the mixture continuously for one-half hour, preferably in a mechanical shaker, whereby the magnesia is precipitated quantitatively. An estimation of the magnesia in the above preparations can easily be carried out in one hour.)—Chem. Analyst; through Drug. Circ., 63 (1919), 444.

Magnesium Salts.—*Manufacture in India.*—The Bombay Government has sanctioned the Pioneer Magnesite Co., Ahmedabad, making a trial on a large commercial scale of the manufacture of magnesium chloride and sulphate by approved methods from bitters found at Pritchard Salt-works, Kharaghoda.—Chem. and Drug., 91 (1919), 145. (K. S. B.)

Magnesium Salts.—*Useless in Cancer.*—The administration of magnesium salts internally has been advocated as being effective in preventing the recurrence of cancer after surgical removal of the original growth. Application of magnesium chloride has also been employed locally to the growth. It has even been claimed that the ingestion of magnesium salts has had a favorable influence on inoperable cases. Laboratory experiments of G. Itani with mouse carcinoma failed, however, to show that magnesium salts exert any influence whatever on malignant growths. As this condition in mice is quite comparable with that in man, these results cast serious doubt on the value of magnesium medication in the treatment of human cancer.—J. Am. Med. Assoc.; through Pharm. J., 103 (1919), 321.

Magnesium Sulphate Cream.—In a paper on the treatment of infected war wounds by magnesium sulphate, Morison gives the following mode of preparation for a *magnesium sulphate cream*: 1.5 pounds of dried magnesium sulphate are mixed with 11 ounces of glycerite of phenol (1 in 10), the latter is put in a hot mortar and the magnesium sulphate added, slowly stirring and mixing with a warm pestle all the time. A thick white cream results, so hygroscopic that on exposure to the air it rapidly absorbs moisture and becomes fluid. The carbolic acid was first added for its analgesic properties, but this precaution was found to be unnecessary, as the only discomfort of which the patients complain when carbolic acid is not present is that the cream feels cold for a short time after its application.—Brit. Med. J.; through Chem. and Drug., 91 (1919), 401.

Magnesium Sulphate Solution.—*Use for Burns.*—S. J. Meltzer finds that a 1 : 4 solution of magnesium sulphate applied at once to the surface of first or second degree burns invariably at once arrests the inflammatory process. Third degree burns run a more favorable course under application of magnesium sulphate than under any other method of treatment. In the advanced stages of second and third degree burns, the favorable action of magnesium sulphate is less striking, especially if infection is present, but even in this stage it has a favorable influence, either in combination or alternating with antiseptic remedies. From experiments with anesthetized animals, it is found that inflammation following scalds is retarded, or even completely prevented, by immersing the scalded area in 1 : 4 solution of magnesium sulphate.—J. Pharmacol. Therap.; through Pharm. J., 103 (1919), 362.

Milk of Magnesia.—*Tests for.*—Realizing that there is a wide variation in the amount of magnesium hydroxide in standard brands of Milk of Magnesia, R. W. Terry analyzed 7 well known brands and 5 control samples. One of the latter was made by the formula of U. S. P. IX, one by N. F. III, one according to Beringer's process modified by the author and two from magnesium oxide. The commercial brands varied from 5.22 per cent. to 9.79 per cent. of $Mg(OH)_2$; the U. S. P. product showed 3.52 per cent. whereas it should be between 6.5 and 7.5 per cent.; the N. F. fell 2 per cent. below the standard of 5.23 per cent.

Phenolphthalein is the proper indicator. Methyl orange added before acidification reacts to form a magnesium lake which does

not have properties of an indicator. If added after acidification, then adding the volumetric alkali precipitates for the moment some $\text{Mg}(\text{OH})_2$ which partially destroys the methyl orange and makes the end-point less sure. In testing for foreign alkalinity Mr. Terry found that titrating the supernatant liquid from the diluted magma saved time, at no loss of accuracy. Every specimen except one showed too great alkalinity. Ignition of the magma determines the presence of starch, sugar, gum or mucilaginous substances more readily than the evaporation and titration directed by the U. S. P.

Mr. Terry modified Mr. Beringer's process by boiling the magma twice with distilled water in order to wash it. The loss was considerable but the time required for the complete process was reduced to three hours, a point worth considering when it is to be prepared extemporaneously. The N. F. formula is faulty in that the prescribed amount of sodium hydroxide is only sufficient to produce 4.7 per cent. $\text{Mg}(\text{OH})_2$. It is difficult to prepare milk of magnesia by hydrating the oxide, for the hydration is not complete, some oxide remaining suspended in the mixture. The U. S. P. magma seems to contain both oxide and hydroxide which does not give the proper viscosity and it requires prolonged washing to free it from alkali. If it is not expected that water will be absorbed in the reaction and if hydration is to be by sodium hydroxide alone, then 125 grammes of magnesium carbonate should be used and 82.37 grammes of absolute sodium hydroxide (at least 91.52 Gm. of U. S. P. sodium hydroxide) to insure complete hydration. In order to have an excess, 100 grammes should be used. The theoretical yield of $\text{Mg}(\text{OH})_2$ would be 7.507 per cent. Mr. Terry believes that magnesium sulphate and sodium hydroxide give a better product. Gelatinization can be controlled by the degree of dilution of the solution and the temperature of mixing. It should be as gelatinous as possible and remain fluid, thus combining pharmaceutical elegance and therapeutic efficiency. A table shows results of tests for chlorides, sulphates, heavy metals, arsenic, and talcum as well as ignition and acid and alkaline permanganate tests. A third table shows the results of microscopic examination.

Mr. Terry summarizes his finding that may be of value to the Revision Committee as follows:

1. That milk of magnesia be prepared by interaction of magnesium sulphate and sodium hydroxide and the sodium hydroxide be in excess of the theoretical amount to at least 10 per cent.

2. That tests be conducted to determine the feasibility of washing the magma by the hot process as above suggested, or by dialysis.

3. That the purity rubric should read, magnesia magma yields not less than 5.0 per cent. nor more than 5.5 per cent. of $\text{Mg}(\text{OH})_2$ (58.34).

4. That the limit of permissible foreign alkalinity be raised to the equivalent of 8.0 mils of N/10 V. S. to 100 mils of magma.

5. That the foreign alkalinity be determined by titration of the supernatant liquid from a diluted magma rather than by evaporation.

6. That a portion of the magma be ignited in a porcelain crucible to determine the presence or absence of carbonizable organic matter.

7. That a test be included to limit the presence of heavy metals.

8. That a test be included to limit the presence of arsenic.

9. That the process be made so as to form a magma containing as high as 6 per cent. $\text{Mg}(\text{OH})_2$ if possible and that it be then assayed and diluted to meet the purity rubric.

10. That the assay process be identical with that of the U. S. P. IX except phenolphthalein replace methyl-orange as the indicator.—J. Am. Pharm. Assoc., 8 (1919), 183. (Z. M. C.)

ZINC AND CADMIUM.

Zinc.—*Normal Constituent of Animal Tissues.*—Delezenne considers that, far from being a casual constituent of the animal organism, zinc is an essential component. It has been found in appreciable quantity in all the organs of every animal examined. In mammalian blood it occurs to the extent of 15 to 25 mgm. per liter and is localized in the organized elements, especially in the leucocytes. The nervous centers and the thymus contain most, as much as 0.1 : 1000. The spleen, thyroid, and muscular tissue contain less, 0.02 : 1000. Fat and bone contain traces only. Zinc occurs in all the secretions. Its universal distribution indicates that it must play an important part in the life of the animal cell.—Am. Inst. Pasteur; through Pharm. J., 103 (1919), 3.

Ghigliotto also considers zinc to be a normal constituent of the human body. He finds it present to the extent of 0.015 to 0.030 : 1000 in the viscera. It was also found in a bovine fetus; in the flesh of fish; in milk; and generally in all foods.—Am. Falsif.; through Pharm. J., 103 (1919), 3.

Zinc Dust.—*Contaminated with Chlorides.*—O. Binder reports on zinc dust which was strongly contaminated with chlorides and could, therefore, not be used for analytical purposes.—Chem. Ztg.; through Pharm. Weekblad, 56 (1919), 658. (H. E.)

Zinc Oxide.—*Contaminated with Lead.*—W. D. Collins and W. F. Clarke state that for a time after the beginning of the war it was difficult to obtain zinc oxide of a quality which would meet the U. S. P. requirements.

Investigation showed the presence of excessive amounts of lead and that the U. S. P. test for heavy metals will not detect less than 0.05 per cent. of lead in zinc oxide.

At the present time, zinc oxide is being produced of a higher quality, with respect to lead, than is called for by the U. S. P.—J. Ind. Eng. Chem., 11 (1919), 138. (L. A. B.)

Cadmium Tungstate.—*Use for Radioscopic Screens.*—The high cost of platinum has necessitated seeking for a cheaper material than barium platinocyanide at present used for screens in X-ray work. Roubertie and Nemirovski propose the use of cadmium tungstate for the purpose. Screens prepared therewith have not the permanent phosphorescence which characterizes those prepared with the various sulphides which have been suggested for the same purpose. They are unsuspected by ordinary physical or atmospheric conditions or by prolonged action of X-rays. It is well known that platinocyanide screens deteriorate with use. The luminescence of the cadmium tungstate screen when excited by X-rays is white. The body radioscoped shows up in black. The image resembles a positive bromo print. This renders radioscopic examination easier, more exact, and less fatiguing to the eyes of the operator than the violet image on the bright yellowish green field of the platino screen. Moreover, direct photographs or cinematographs may be taken from the image on the screen. This is impossible when a barium platinocyanide is used.—Compt. rend.; through Pharm. J., 103 (1919), 362.

MERCURY.

Mercury.—*Assay as Mercury-Zinc Thiocyanate.*—George S. Jamieson describes a method for the determination of mercury from mercuric compounds by precipitation as the mercury-zinc thiocyanate and either weighing the precipitate or titrating same

with a standard solution of potassium iodate. The mercury is precipitated in neutral or acid solutions with a reagent containing 39 grammes of ammonium thiocyanate and 29 grammes of zinc sulphate per liter, the acidity of the solution not being greater than 5 per cent.

The precipitate of mercury-zinc thiocyanate may be dried at 102-108° and weighed; the weight of the precipitate multiplied by 0.40258 giving the mercury content.

The volumetric method is based on the oxidation of the acid radicle in $\text{HgZn}(\text{SCN})_4$ by means of potassium iodate in a solution strongly acid with hydrochloric acid and in the presence of an immiscible solvent such as chloroform; the end-point being the disappearance of the iodine color, due to the formation of iodine chloride. An empirical solution of potassium iodate containing 19.2191 grammes per liter was used, each mil of which was equivalent to 0.003 gramme of Hg.—J. Ind. Eng. Chem., 11 (1919), 296. (H. E.)

Mercury.—*British Imports.*—The British imports of mercury for the past six years were as follows: 1913, 45,349 bottles; 1914, 37,569 bottles; 1915, 40,579 bottles; 1916, 34,043 bottles; 1917, 28,966 bottles; and 1918, 14,366 bottles.—Chem. and Drug., 91 (1919), 355. (K. S. B.)

Mercury.—*Insecticidal Properties of.*—A paper read before the All-India Entomological Conference states that a drop of mercury in a small vessel set on top of grain or pulse, in the receptacle in which it is stored, prevents the breeding of weevils, beetles, etc. A drop or two of mercury inside a piano is also said to protect it from various bores and weevils.—Chem. and Drug., 91 (1919), 586. (K. S. B.)

Mercury.—*Production in Spain.*—W. M. Strachan furnishes statistical data regarding the production and exportation of mercury from Spain.

From 1908 to 1916, inclusive, practically twenty-one million pounds of mercury were exported from Spain, and the entire production of the country is exported chiefly to Great Britain.—Comm. Rept.; through Am. J. Pharm., 91 (1919), 746. (I. G.)

Mercury.—*Production in the United States.*—During 1918 the United States produced 33,432 bottles of mercury, more than

2,000 bottles less than the previous year. California produced 23,331 bottles in 1918, and 23,938 bottles in 1917. During the first half of the year, the United States imported 3,491 bottles.—Chem. and Drug., 91 (1919), 415. (K. S. B.)

Mercury.—*Recovery from Nessler's Solution.*—D. Pullman recovers the whole of the mercury and iodine from used Nessler solution by the addition of a soluble mercury salt to the neutralized residues. The mercuric iodide thus obtained is converted by means of metallic zinc into zinc mercuric iodide and mercury. The double salt, with the addition of sodium hydroxide, forms an efficient Nesslerizing reagent, while the mercury is dissolved in nitric acid and used to precipitate further residues.—Pharm. J., 102 (1919), 94.

Mercury.—*Use as Embalming Agent in the Middle Ages.*—One of the Dukes of Bedford was buried at Rouen in 1435. Chemical analysis by A. Leroy of the material used for embalming his body has revealed the presence of metallic mercury. Probably the embalming substance was a balsamic mercurial unguent.—Compt. rend.; through Pharm. J., 102 (1919), 389.

Calomel.—*Incompatibility with Antipyrin.*—Calomel and antipyrin do not react on each other in neutral or acid solutions, but in the presence of an alkali, substances are liable to be formed which are more poisonous than mercuric chloride. C. Paderi found two products of reaction of calomel and antipyrin in an alkaline medium, one in which the mercury is linked on the two nitrogen atoms of two molecules of antipyrin and another one in which the mercury is linked with the nitrogen of antipyrin and with chlorine. Especially the latter compound, which is liable to be formed in the alkaline intestinal secretions, is extremely poisonous. A mixture of calomel and antipyrin should, therefore, not be administered to children.—Arch. Farm.; through Pharm. Weekblad, 56 (1919), 1310. (H. E.)

Calomel.—*Preparation of.*—P. Duret makes the following three solutions: (1) Mercuric chloride, 11.5; pure hydrochloric acid, 10 drops; distilled water, 100. (2) Sodium bicarbonate, 6; pure glucose, 10; distilled water, 80. (3) Crystalline magnesium chloride, 7.5; distilled water, 20. Mix solutions 1 and 2, and pour at once into 3, contained in a 500 mil flask; shake and set aside;

carbon dioxide is abundantly evolved and calomel precipitated in a very fine state of division. When the evolution of carbon dioxide slackens, warm the mixture on a water-bath, cool, filter, and wash the precipitate with cold water. The yield is about 10 of calomel. The proportions of ingredients must be strictly observed; if too much sodium bicarbonate is used the precipitate will contain magnesium carbonate; if too little is used the calomel may be contaminated with mercuric chloride. The calomel obtained occupies about three times the volume of ordinary calomel; as it is readily dissociated it should prove valuable for antisymphilitic injections.—Ann. Inst. Pasteur; through Pharm. J., 103 (1919), 142.

Calomel Ointment.—*Preparation of.*—Calomel ointment, which is used as a prophylactic for syphilis, has been permitted by the French government to be sold without a physician's prescription. The original formula recommended by Metchnikoff consisted of 33 parts of calomel, 67 parts of wool fat and 10 parts of petrolatum. P. Duret recommends the following formula by which a more stable product is obtained. 10 parts of crystallized magnesium chloride and 7 parts of sodium bicarbonate are dissolved in 25 parts of water and to the solution 10 parts of calomel and 15 parts of glycerite of starch are added. Twenty parts of wool fat are melted with 10 parts of arachis oil and 0.15 part of camphor and 0.15 part of thymol previously dissolved in 5 parts of arachis oil. The latter mixture is then added to the former and the mass is triturated until a uniform ointment is obtained.—Ann. Inst. Pasteur; through Pharm. Weekblad, 56 (1919), 1399. (H. E.)

Mercuric Chloride.—*Antidote for.*—Under the caption "Pharmaceutical Fragments" calcium sulphide is said to act as an antidote for mercuric chloride. It should be administered in solution freshly prepared. At least one grain of the sulphide should be given for each grain of the bichloride swallowed.—Bull. Pharm., 33 (1919), 88. (C. M. S.)

ALUMINUM AND CERUM.

Aluminum.—*Flux for Soldering.*—The following flux for soldering aluminum is given: Lithium chloride, 15 parts; potassium chloride, 45 parts; sodium chloride, 30 parts; potassium fluoride,

7 parts; sodium bisulphate, 3 parts.—Chem. and Drug., 91 (1919), 1042. (K. S. B.)

Aluminum.—*Presence in Plants.*—J. Stoklasa found that plants which grow in a dry soil contain only traces of aluminum, while plants growing in wet places or in water contain an appreciable amount of the metal. Thus algæ with 2.33 per cent. of aluminum, calculated for the dry plant, were found. Dry horse-tail rush contained 1.73 to 1.77 per cent. in the root, but only 0.34 to 0.47 per cent. in the plant. In general the plants contain less aluminum in their aerial parts.—Biochem. Zsch.; through Pharm. Weekblad, 56 (1919), 1326. (H. E.)

Aluminum.—*Polishing of.*—Aluminum can be polished with a solution of borax containing a sufficient quantity of stronger ammonia water. Oxide of tin also acts as a polish on most metallic surfaces.—Chem. and Drug., 91 (1919), 225. (K. S. B.)

Aluminum Acetoborate.—*Manufacture of.*—Boric acid may be used to stabilize aluminum acetate solutions. Such a solution of aluminum acetoborate may be made from 700 grammes of aluminum acetate, 30 grammes of boric acid and 1000 grammes of water. An *emulsion of aluminum acetoborate* may be prepared by mixing together 3 grammes of boric acid, 10 grammes of aluminum acetate, 40 grammes of lime water and 50 grammes of liquid petrolatum. This emulsion is used for burns and in skin troubles.—Boll. chim. farm.; through Chem. Abstracts, 13 (1919), 54.

Aluminum Chloride.—*Use for Hyperidrosis.*—A 25 per cent. solution of aluminum chloride, applied every other day, is recommended for hyperidrosis. Any itching or soreness following its use can be treated with boric acid lotion, calamine lotion, or cold cream.—Chem. and Drug., 91 (1919), 699. (K. S. B.)

Kaolin.—*New Sources of.*—New strata of kaolin have been discovered in the island of Börnholm. Temporary investigations indicate that the deposits are rich and that the quality is of the very best.—Berlingske T.; through Chem. News, 118 (1919), 238.

Cerium Nitride.—S. Fabaron finds that on heating metallic cerium in a hermetically sealed copper tube the oxygen of the

contained air combines with the copper at a red heat; the nitrogen is fixed by the cerium, forming cerium nitride, CeN_2 . This is a grayish black substance, which on contact with water liberates ammonia and forms cerium oxide, CeO_2 . Cerium nitride does not appear to have been previously described.—Ann. Chim. Analyst; through Pharm. J., 102 (1919), 346.

LEAD.

Lead.—*Influence of Impurities upon Resistance to Sulphuric Acid.*—The higher the percentage of copper in lead the greater the resistance to the action of heated concentrated sulphuric acid, says C. E. Barrs. Two specimens showed a variation of 50° in the temperature at which the action of the acid upon the lead was noticed.—Chem. and Drug., 91 (1919), 1414. (K. S. B.)

Lead Salts.—*Microchemical Detection of.*—G. Denigès identifies lead salts under the microscope as the crystalline iodide. With lead sulphate, a sample placed on the slide is treated with 20 per cent. potassium iodide solution when the hexagonal yellow crystals appear after a few minutes. Soluble lead salts are dissolved in a drop of 20 per cent. potassium bromide solution and this is then dropped into a drop of 20 per cent. potassium iodide solution placed upon a slide, when the lead iodide crystals appear. Insoluble lead salts are mixed with the 20 per cent. potassium iodide solution and to the mixture is added one drop of 10 per cent. sulphuric acid, when the lead iodide crystals are formed. Lead chromates, cyanide and fluoride are mixed with concentrated hydrochloric acid and evaporated and the residue treated as a soluble lead salt. In a similar manner, metallic lead and lead sulphide may be treated except that concentrated nitric acid is used as the reagent to make them soluble.—Bull. soc. pharm. Bordeaux; through J. pharm. chim., 20 (1919), 159.

Lead.—*Volatility in Plants.*—Much discussion has taken place in the past as to the possibility of minute traces of lead being given off in a volatile combination from fresh paint. The following experiments are brought forward by Herman to show that this does actually occur. A round of pure filter paper is laid flat in a desiccator containing commercial white lead, rubbed down in linseed oil. After twenty-four hours the paper will afford positive reactions for

minute traces of lead. None is found in a similar paper exposed in a desiccator in which there is no white lead. If the same experiment is repeated with lead paint prepared two days previously, no reaction for lead is obtained from the paper. It appears, therefore, that the volatile lead compound is given off only from freshly mixed paint. Similar experiments also gave positive results for lead when made in a room in which painters were applying white lead paint. Here there was not the same certainty, as in the preceding experiment, that none of the lead found was due to contamination by air-conveyed micro-droplets.—*Bull. Acad. Med. Belg.*; through *Pharm. J.*, 103 (1919), 142.

Lead Acetate.—*Comments on B. P. Method of Determination of.*—Experiments with the method of the British Pharmacopœia for determination of lead in lead acetate conducted by R. L. Morris indicate that at least 25 per cent., and preferably 50 per cent., of glacial acetic acid should be present at the time of precipitation with oxalic acid when working with from 0.4 Gm. to 0.6 Gm. of lead acetate in order to get complete precipitation and a normal oxalate. A large excess (about 2 Gm. for above amounts of lead acetate) of oxalic acid is also necessary for best results.—*Chem. and Drug.*, 91 (1919), 242-3. (K. S. B.)

Lead Iodide.—*Solubility in Ammonium Chloride Solution.*—Commenting upon the statement of the British Pharmacopœia 1914 that lead iodide is soluble in a solution of ammonium chloride "Abel Scholar" says that 1 gramme of lead iodide placed with 1 gramme of ammonium chloride and 9.5 mls of distilled water in a corked 2 ounce bottle showed no signs of solution after several days; kept at 80° for several days it showed no signs of solution, but changed color, indicating the following probable chemical change: $\text{PbI}_2 + 2\text{NH}_4\text{Cl} = \text{PbCl}_2 + 2\text{NH}_4\text{I}$. The color deepened with concentration. On cooling some crystals of lead chloride appeared. Addition of 20 mls of distilled water precipitated lead iodide, which showed signs of solution upon warming. On cooling the familiar spangles of lead iodide precipitated.—*Chem. and Drug.*, 91 (1919), 895. (K. S. B.)

ZIRCONIUM.

Zirconium.—*Assay of.*—The formation of a phosphate in an acid medium has been used by Hillebrand to analyze zircons,

and it seemed to be of interest to find out whether the precipitation of zirconium is really complete in presence of iron, chromium, and aluminium. The reaction would be characteristic of zirconium, since bismuth, which is very rarely associated with it, is the only element which could be determined in these conditions. Nicolardot and Reglade have carried out a series of tests to determine the effect of the acidity of the solutions of foreign salts and of the time of contact with the reagents before filtration. The salt used was pure nitrate of zirconium, and the foreign salts added were those of iron, aluminium, and chromium. The results showed that ammonium phosphate in an acid medium (20 per cent. at least of sulphuric acid) is a characteristic reagent for zirconium in presence of iron, aluminium, and chromium, and bismuth is the only other element which is precipitated in these conditions.—Compt. rend.; through Chem. News, 118 (1919), 179.

Zirconium Ore.—*Analysis of Brazilian.*—A description of the method of analysis of Brazilian zirconium ore is given by A. R. Powell and W. R. Schoeller. The finely ground ore is fused with sodium carbonate, the melt extracted with water, and the insoluble portion fused with bisulphate. This eliminates silica, and renders the other constituents soluble. The solution is precipitated with sodium thiosulphate and the ignited precipitate weighed as $\text{ZrO}_2 + \text{TiO}_2 + \text{Al}_2\text{O}_3$. Titania and alumina are determined, zirconia being obtained by difference. Iron, magnesium, calcium and manganese are determined in the filtrate from the thiosulphate precipitate.—Chem. and Drug., 91 (1919), 1316. (K. S. B.)

ARSENIC, ANTIMONY AND TIN.

Arsenic.—*Colloidal.*—Soref recommends experimenting with colloidal arsenic, which, without doubt, has a great future in therapeutics because it is only very slightly toxic, considerably less so than other arsenic compounds of inorganic and organic nature.—Bull. Sci. Pharmacol.; through Drug. Circ., 63 (1919), 381.

Arsenic.—*Electrolytic Assay of.*—R. W. Terry gives details of the electrolytic assay of arsenic. The interested reader should refer to the original paper.—Midland Drug., 53 (1919), 132. (A. G. B.)

Arsenic.—*Modified Ammonio-Magnesium Assay of.*—O. Bailly recommends the application of Bauzil's phosphate assay (see YEAR

BOOK, 1917, 283) to arsenates. He treats the arsenical solution with citric acid, then precipitates the arsenic as ammonio-magnesium arsenate, washes the precipitate free from the other ingredients of the precipitating reaction, "spritizes" the washed precipitate from the filter paper into a beaker and then titrates with half-normal sulphuric acid, using helianthin as indicator. This titration is represented by the equation $\text{MgNH}_4\text{AsO}_4 + \text{H}_2\text{SO}_4 = \text{NH}_4\text{H}_2\text{AsO}_4 + \text{MgSO}_4$ and each mil of half-normal acid employed represents 0.01875 gramme of arsenic.—J. pharm. chim., 20 (1919), 55.

Arsenic.—*Production in America.*—The United States production of arsenic during 1918 was about 6,400 tons, a 10 per cent. increase over 1917. The imports during 1918 were about 5,600 tons, two-thirds of which came from Mexico and the remainder, excepting small amounts from England and Australia, from Canada.—Chem. and Drug., 91 (1919), 815. (K. S. B.)

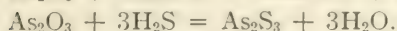
Arsenic.—*Production in Rhodesia.*—A new source of arsenic, recently tapped in Rhodesia, is yielding at the rate of 30 tons monthly.—Chem. and Drug., 91 (1919), 189. (K. S. B.)

Arsenic Compounds.—*Those Suitable for Internal Medication.*—E. Crouzel contends that solution of arsenous acid is not suitable for internal medication since it has a corrosive action upon the mucous membrane of the stomach. In its place, he recommends sodium cacodylate, sodium or potassium arsenate, potassium arsenite or disodium methylarsinate.—Rept. pharm.; through Chem. Abstracts, 13 (1919), 2727.

Arsenic Trioxide.—*Microchemical Detection of.*—O. Tunmann describes his method of sublimation of arsenic trioxide from an asbestos plate and the study of the sublimate, which occurs in octahedrons, tetrahedrons and sometimes in monoclinic crystals. In this manner, arsenic trioxide may be directly sublimed from powders, pills or even salves. To the sublimate should always be applied the silver nitrate reaction.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2961.

Arsenic Acid.—*Assay of.*—The following method based on the reduction of arsenic acid to arsenous acid by means of potassium

sulphocyanide is given by Winkler. The solution containing from 0.01 to 0.15 gramme of As_2O_5 is treated with 10 mls of hydrochloric acid and 5 mls of a 20 per cent. solution of potassium sulphocyanide, and into the mixture sulphuretted hydrogen gas is conducted for one hour. The mixture is allowed to stand for 18 hours, and the precipitate consisting of arsenic trisulphide and sulphur is collected on a filter, washed and dried to constant weight. The arsenic is calculated according to the equations:



The precipitate, while still moist, may also be dissolved in ammonia water and oxidized with hydrogen dioxide solution. The arsenic is then determined in the usual way as ammonium-magnesium arsenate or magnesium pyroarsenate. When arsenic acid is to be precipitated as ammonium-magnesium arsenate directly, to the solution, measuring about 100 mls, 2.5 grammes of ammonium chloride and 10 mls of a solution containing 5 per cent. of ammonium chloride and 10 per cent. of magnesium sulphate are added, the mixture is allowed to stand over night and the ammonium-magnesium arsenate is estimated in the usual way.—Z. angew. Chem.; through Drug. Circ., 63 (1919), 438.

Arsenous Acid.—*Reaction with Iodine.*—The ash in arsenous acid is best estimated by determining the conductivity of a diluted solution, provided the ash is not less than 0.1 per cent. The conductivity should be not greater than 5×10^{-5} , according to I. K. Kolthoff. Arsenic acid and other acids are estimated by titration, using dimethyl yellow or methyl red as indicators. While a slightly acid solution of arsenous acid does not change its titer, in a strong alkaline solution an oxidation of the arsenous acid to arsenic acid takes place. When a N/10 or N/100 normal solution of arsenous acid is titrated with iodine solution the P_H varies at the end of the titration between 11.0 and 5.0, while when a N/10 or N/100 normal solution of iodine is titrated with arsenous acid the limits at the beginning of the titration are between 9.0 and 5.5 and at the end of the titration between 8.0 and 5.0.—Pharm. Weekblad., 56 (1919), 621. (H. E.)

Sodium Arsenate.—*Toxicity Compared with That of Di-Sodium Methyl Arsenate.*—Tests of the toxicity of di-sodium methyl

arsenate and sodium arsenate on guinea pigs conducted by P. S. Pittenger showed a minimum lethal dose of 0.12 gramme per 250 grammes body weight of guinea pig for the former and 0.012 gramme per 250 grammes guinea pig for the latter. This indicates a toxicity ratio of ten to one which bears out the correctness of the recognized dosage of these substances; the dosage of di-sodium methyl arsenate being given at about twelve times that of sodium arsenate.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 172. (R. P. F.)

Antimony.—*Assay of.*—Beam and Freak assay antimony by a process which is a modification of that proposed by Schidrowitz and Goldsbrough, and consists in depositing the metal on a strip of copper foil, as in the Reinsch test, dissolving the antimony in a boiling alkaline permanganate solution, reduction with sulphur dioxide, and conversion of the antimony into colloidal trisulphide in the presence of gum. Colorimetric comparison is then made with solutions prepared from a standard potassium antimonyl tartrate solution.—*Chem. and Drug.*, 91 (1919), 494.

Antimony.—*Colloidal.*—F. L. Usher reports attempts to prepare stable solutions of metallic antimony for medical use. Chemical reduction methods invariably gave the metal as a precipitate; electric dispersion methods in organic media gave very unstable solutions except in the case of ethyl alcohol. Transference from alcohol to water, however, makes the solution unstable, even when air was excluded. Paal's protalbic acid method is inapplicable to antimony compounds. Solutions of the sulphide, 1 in 500, are now used; they are very stable when protected with gum arabic.—*J. Soc. Chem. Ind.*, 38 (1919), 98R.

Antimony Salts.—*Analysis of.*—Various methods have been suggested for the analysis of antimony sulphide, which may contain free sulphur, antimonious acid, antimonates, red antimony sulphide, antimony oxysulphides, or calcium sulphate. The oldest methods of determining the amount of free sulphur depended upon the extraction of it by carbon disulphide, using a Soxhlet apparatus, and it has recently been found that the pentasulphide is practically unattacked in the cold, and even on warming only about 0.4 per cent. is reduced. Benzene or acetone can be used as solvent, but if benzene is used the pentasulphide must previously be thoroughly dried. Acetone is not to be recommended, for it dissolves a small

quantity of the sulphide in addition to the free sulphur. Another method of determining the impurities depends upon the fact that antimony pentasulphide is completely soluble in warm ammonia, and the other substances present can be filtered off and determined in the usual way. To estimate the total sulphur the sulphide can be dissolved in a solution of pure potash and then subjected to the action of chlorine, when all the sulphur is transformed into sulphuric acid and the antimony into antimonie acid. Fuming nitric acid can also be used to convert the sulphide into sulphate, which can be estimated as barium sulphate in the usual way, and hydrogen dioxide acts similarly. If the sulphide is dissolved in pure sodium sulphide the percentage of antimony present can be determined by electrolysis, platinum electrodes being employed; but this process cannot be recommended, for the values obtained are always too high. By treating a solution of the sulphide with soda and hydrogen dioxide and adding alcohol, a precipitate of sodium antimonate is obtained after thirty-six hours' standing. From the weight of this precipitate the amount of antimony present can be deduced. In an alternative process the antimony is determined as tetroxide, Sb_2O_4 . A given weight of the sulphide is heated over a water-bath with hydrochloric and nitric acids. The solution is evaporated to dryness, taken up with hydrochloric acid, diluted, and filtered. The precipitate consists of silica and calcium sulphate. The antimony is contained in the filtrate, which is decomposed by HCl , and oxidized to give Sb_2O_4 .—Rev. *Produit. Chim.*; through *Chem. News*, 118 (1919), 275.

Tin.—*Assay of.*—I. M. Kolthoff and R. Van der Heijde estimate tin also in the presence of antimony as follows. To a tin solution containing 0.6 per cent. of tin in about 14 per cent. hydrochloric acid 2 drops of a 1 per cent. solution of an antimony salt and 200 Mgm. of reduced iron are added and the mixture is heated in a flask covered with a funnel until the iron is dissolved. A piece of marble is then added, the mixture is rapidly cooled, mixed with 100 mls of oxygen-free water, about 1 gramme of sodium carbonate, a few mls of 14 per cent. hydrochloric acid and an excess of volumetric iodine solution and the excess of iodine titrated back with sodium thiosulphate solution. From the amount of iodine used to convert the stannous chloride into stannic chloride the amount of tin is calculated. Alloys with antimony are dissolved in strong sulphuric acid, the solution mixed with hydrochloric acid,

the mixture reduced with reduced iron and after filtering the filtrate is reduced once more by the method given above.—Pharm. Weekblad, 56 (1919), 1466. (H. E.)

Tin.—*Solubility in Distilled Water.*—Jermstad and Gaule find that tin dissolves upon boiling in distilled water, in 1 per cent. sodium chloride solution and in 0.5 per cent. phenol solution, provided the tin tubes are rubbed together during the boiling. If the tin is boiled even 10 hours without rubbing in the fluids just named no tin dissolves; neither does it dissolve on boiling with 1 per cent. morphine hydrochloride, 0.01 per cent. atropine sulphate, 0.1 per cent. cocaine hydrochloride, 5 per cent. sodium cacodylate, 0.1 per cent. strychnine nitrate, 25 per cent. solution of caffeine sodium benzoate solution, 20 per cent. caffeine sodium salicylate solution, digalin, nor in 1 per cent. novacaine. On the other hand, boiling in a 0.35 per cent solution of sodium arsenate induces solution of tin.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 1370.

Colloidal Tin Oxide.—*Use in Influenza.*—A. Netter reports on the treatment of influenza at Hospital Trousseau. It was found that a brand of colloidal tin oxide known as *collobiose d'etain* was of great service in combating the infection. The preparation, which is marketed in 2 mil ampuls containing 0.42 milligramme of colloidal tin to the mil, was administered by intramuscular injection combined with camphorated oil.—J. pharm. chim., 19 (1919), 122.

Stannoxyd.—*Use in Broncho-pneumonia.*—A. Compton reports on satisfactory use of stannoxyd (a mixture of tin and tin oxide) in staphylococcal infections such as broncho-pneumonia.—The Prescriber; through Am. J. Pharm., 91 (1919), 122.

BISMUTH.

Bismuth.—*Determination by Formaldehyde.*—The following method for the determination of bismuth by formaldehyde, given by S. B. Tallantyre, is said to give results practically identical with those obtained by the ignition process. Warm the compound or preparation for a few minutes with a small quantity of 10 per cent. hydrochloric acid until completely decomposed and all

bismuth is in solution. Add a fair amount of formaldehyde and an excess of 10 per cent. sodium hydroxide, warm, then boil until all bismuth is precipitated. Repeat the process with the supernatant liquid to insure complete reaction. Decant or filter, and wash the bismuth with weak formaldehyde water. If the bismuth is not well coagulated, boil with a little more formaldehyde and sodium hydroxide solutions, when stirring or pressing will collect the precipitate in a spongy mass which is transferred to a Gooch crucible, tared filter, or weighing bottle, washed with absolute alcohol, dried an hour or two at 150° and weighed.—Chem. and Drug., 91 (1919), 827. (K. S. B.)

Bismuth.—*New Test for.*—Denigès describes an extremely simple microscopic test for bismuth, which is based upon the extemporaneous formation of well-defined, colorless microcrystals of hexamethylenetetramine-chlorobismuthate. The test is applied as follows: A drop of hydrochloric acid is diluted with a drop of water on a slide, and a droplet of a 4 to 5 per cent. solution of hexamethylenetetramine is added. If a solid compound is to be tested, a few particles are dropped on to the middle of the drop of reagents; if a solution, a drop is brought into contact at the edge of the mixture on the slide. It is unnecessary to mix or cover by a cover-slide, and the preparation can be immediately examined under the microscope. If bismuth is present in the neighborhood of the particles, or at the point of contact of the solutions, colorless, very brilliant crystals will be seen.—Bull. soc. pharm. Bordeaux; through Chem. and Drug., 91 (1919), 439.

MOLYBDENUM.

Molybdenum.—*War-Time Production of.*—The war had a marked effect in stimulating the production of molybdenum. On the outbreak of hostilities the price of molybdenite suddenly rose, and in a remarkable degree, the reason apparently being that Germany, aware of the impossibility of laying up enough tungsten, was buying molybdenite to take its place. During the war both England and France found themselves short of tungsten, and they, too, had recourse to molybdenum in the production of high-speed steels. The French used molybdenum in the breech-blocks of some of their field guns, but never, it appears, in shells, armor-plate, or gun-linings. Later in the war it was proposed to make

armor-plate containing molybdenum, and contracts were entered into in America to produce such plate. Steel companies were parties to large contracts for molybdenum; but before the steel was actually put to use the war ended. One of the companies concerned used molybdenum, to the extent of less than 1 per cent., in making crank-shafts and connecting rods for Liberty motors.—Eng. Min. J.; through Chem. News, 118 (1919), 238.

CHROMIUM AND MANGANESE.

Chromic Acid.—*Iodometric Assay of.*—In the iodometric estimation of chromic acid the following observations are recorded by I. M. Kolthoff and E. H. Vogelenzang. The titration can be carried out immediately after the addition of the acid, which should be present in a concentration of at least 20 mls of 4 $\frac{1}{N}$ acid for every 100 mls. The iodide and dichromate concentrations are of no influence. When less hydrochloric acid is present, too much thiosulphate is used, but this excess is not due to an oxidation of the hydriodic acid by the oxygen of the air but to a peculiar side reaction in which both chromic acid and thiosulphate take part. Direct sunlight, especially in the presence of molybdate, favors the taking place of this reaction. On the other hand the presence of molybdate retards the reaction, when the titration is carried out immediately after the addition of the reagents or when the liquid is kept in a dark place. This peculiar catalytic action of molybdate between chromic acid and hydriodic acid is very remarkable. Ferrous salts in strongly acid solutions are negative catalyzers; in weak acid solutions, however, they have a positive catalytic effect. Temperatures have no influence on the velocity of the reaction. Very diluted chromic acid solutions can be estimated iodometrically just as accurately as strong solutions. A dilution of the chromic acid solution after the addition of the reagents does not increase the sharpness of the end-point in the titration and is therefore superfluous.—Pharm. Weekblad, 56 (1919), 514. (H. E.)

Manganese.—*Detection of.*—H. Caron and D. T. Raquet found that in slightly acid solutions of manganese salts when treated with an excess of an alkali oxalate and certain oxidizing agents such as potassium dichromate, sodium hypochlorite, etc., a currant-red color is produced due probably to the formation of a manganese alkali oxalate. If the solution contains an excess of a mineral acid,

this should be partly destroyed by the addition of potassium oxalate. Large quantities of iron interfere with the reaction, while zinc has no influence on it, any zinc oxalate which is formed being easily dissolved by the addition of acetic acid. The reaction which is not as sensitive as those with permanganate, lead peroxide, persulphates, etc., has the advantage over these in that it can be carried out in the presence of chlorides.—Rept. pharm.; through Pharm. Weekblad, 56 (1919), 1235. (H. E.)

Referring to this reaction D. H. Wester writes that it is by no means a new one and has already been given by J. F. Sacher ("Chem. Zeit.," 1915, page 319). The red-colored substance produced, $K_3Mn_4(C_2O_4)_3 \cdot 3H_2O$, has been described by Souchay and Lenssen and also by Fromberg and Kehrmann. The only new feature in the reaction is the application of potassium oxalate. While Caron and Raquet claim that the sensitiveness of the reaction is one part of manganese in 20,000 parts, Sacher found that by it one part in 200,000 parts can be detected. The writer claims that by reversing the reaction as little as 0.00025 gramme of oxalic acid can be detected. He further contradicts the statement that chlorides inhibit the detection of manganese by the lead peroxide and persulphate method.—Pharm. Weekblad, 56 (1919), 1289. (H. E.)

Furthermore P. H. Hermann found that the reaction can be utilized for detecting nitrous acid. When to a solution of nitrous acid or of a nitrite 2 mils of a 5 per cent. potassium oxalate solution, one mil of a 5 per cent. manganese sulphate solution, a few drops of 25 per cent. acetic acid and a few drops of hydrogen peroxide solution are added, a currant-red color is produced when as little as 0.03 mgm. of sodium nitrite is present in one mil of the solution. In regard to the oxidizing agents to be used in the reaction for manganese Herman reports that hydrogen dioxide, the halogens, chlorates, iodates and potassium ferrocyanide react in a negative way, while chlorinated lime, potassium permanganate, potassium bichromate, manganese dioxide, lead peroxide, cerium-ammonium nitrate, weak solutions of nitrous acid and nitrogen tetroxide give good results.—Pharm. Weekblad, 56 (1919), 1344. (H. E.)

Collosol Manganese.—*Use in Furunculosis.*—In the case of a man suffering acutely from boils for five years, Levinson gave an injection of 0.5 mil of collosol manganese, and each week following for the next five weeks an injection of 1 mil. After the second

injection, the boils, five in number, rapidly cleared up, and the patient has since been absolutely clear, and felt better in general health.—*Brit. Med. J.*; through *Chem. and Drug.*, 91 (1919), 63.

Manganese Ore.—*Mexican.*—Consul J. B. Stewart writes from Chihuahua that the present high price of manganese ore in the United States has stimulated the locating of claims and the shipping of the ore. It is found at some points associated with silver, in others with gold and iron. The greater portion seems to exist in cretaceous limestones.—*Nat. Drug.*, 49 (1919), 11. (C. M. S.)

IRON, COBALT AND NICKEL.

Iron.—*Future of the German Industry.*—The loss of the Briey Basin, with its immense deposits of rich iron ore, locally known as "Minette," is a staggering blow to the iron industry of West Germany. Germany has in recent years built up a great iron and steel industry, of which the principal center is the Rhenish-Westphalian districts. It is affirmed that on that industry one-tenth of the population of Germany subsists. But the home production of ore has not kept pace with the output of finished iron, so that more than half of the requirements of the blast-furnaces has had to be imported, many foreign sources having been drawn upon. The ending of the war, so disastrous for Germany, has shaken this great industry to its foundation. The minette of Lorraine is henceforth unavailable. What this means to the industry of the Rhineland will be understood if we consider the fact that out of the 28.6 million tons of ore used in 1913, 21 million tons came to the works from Lorraine. France, which before the war was rich in iron ore, is now likely to become the richest in Europe, thanks in large part, the writer adds, to German intelligence and enterprise. For since 1870 the minette deposits have been brought into their present productive state under German management. German manufacturers must, therefore, set themselves to work the poorer ores of the country and carefully conserve all scrap.—*Chem. Ztg.*; through *Chem. News*, 118 (1919), 238.

Iron.—*Reaction with a Yeast.*—W. Beyerinck reports that *Saccharomyces pulcherrimus* contains a lactose that produces a red pigment when treated with a trace of iron in the presence of

air. The yeast, cultivated in a medium free from iron, when treated with as small an amount as 10 milligrammes of ferric citrate in 100 mls of fluid develops reddish halos of pigment around each cell. While the color is discharged by addition of strong bases, it is restored on adding acids and can be actually boiled in diluted sulphuric acid without decomposition.—Arch. Neerland Physiol.; through J. pharm. chim., 19 (1919), 46.

Iron Alloys.—*Various Types of.*—J. Escade describes interestingly the various modern types of iron alloys, such as ferrochrome, ferrosilicon, ferromanganese, ferronickel (including *invar* and *platinite*), ferrovanadium, ferrotitanium, ferrotungsten and ferrocium or *Auer metal*. He describes manufacture, properties and uses of each of these new metals.—Rev. gén. sci.; through J. pharm. chim., 20 (1919), 23.

Iron Preparations.—*Assay of.*—G. Mossler, discussing the German Pharmacopœia, suggests improvements in the iron assay of official preparations. *Saccharated ferrous carbonate* and *saccharated ferrous oxide*, he converts into ferric chloride with hydrochloric acid and permanganate and then assays the ferric salt by the iodide, thiosulphate method. *Metallic iron*, he converts into ferric sulphate with sulphuric acid and permanganate and then proceeds with the ferric assay as outlined above. *Dialyzed iron*, he advises should be assayed for chloride by treating with excess of N/10 silver nitrate V. S. and nitric acid and then titrating residual silver by the Volhard method. The present iron assay he finds satisfactory.

Reduced iron, he converts with ferric sulphate as described above but before doing so he treats the sample with mercuric chloride. This makes necessary a careful manipulation throughout the entire assay, for the details of which the reader is referred to the original article.

Extractum ferri pomatum and its tincture are ignited in a quartz dish, the ash is fused with potassium bisulphate, the melt is dissolved in water, the filtered aqueous liquid and washings are oxidized to ferric sulphate with sulphuric acid and permanganate and the ferric solution titrated by potassium iodide, thiosulphate method.

In some of the cases of oxidation with permanganate all of the permanganate is not consumed. In such cases, the pink fluid is

decolorized by the addition of tartaric acid prior to beginning the ferric assay.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2960.

Colloidal Iron.—*Use in Typhoid.*—At a meeting of the Société de Thérapéutique, Dr. Laumonier reported that he found colloidal iron very efficacious in typhoid fever. He employed six intravenous injections (5 mls of solution containing 5 milligrammes of pure iron), one every three days, and found the results were much more satisfactory when injections of colloidal gold were employed.—J. pharm. chim., 19 (1919), 267.

Ferrous Salts.—*Assay of.*—I. M. Kolthoff gives the following method for assaying ferrous salts iodometrically. To 10 mls of the solution of the ferrous salt, which should be about one-tenth normal and slightly acid, 25 mls of N/10 potassium bromate solution and 10 mls of 25 per cent. phosphoric acid are added. After allowing the mixture to stand for five minutes in a closed flask 5 mls of a 10 per cent. potassium iodide solution and 2 drops of ammonium molybdate solution are added and after five minutes the liberated iodine is titrated with N/10 sodium thiosulphate solution. Each ml of potassium bromate solution corresponds to 1/10 millimol of ferrous salt.—Pharm. Weekblad, 56 (1919), 1565. (H. E.)

Ferrum Reduction.—C. H. La Wall and J. W. E. Harrison direct attention to the fact that the tests of U. S. P. IX for this substance are no more rigid than those of U. S. P. VIII. The limit of sulphide is of considerable importance. If it is in excess of the amount permitted by the U. S. P. there will be unpleasant eructations of hydrogen sulphide when the hydrochloric acid of the gastric juice comes in contact with the reduced iron. Prior to 1914 a product of this quality was easily obtainable and manufacturers did not complain that the standard was too high. After the U. S. P. IX became official an inferior quality was supplied as "technical" or with the statement that "it contains sulphides in slight excess of the U. S. P. limit." Pharmacists should refuse to accept such inferior products and State boards should make inspections and follow them with prosecutions to arouse the trade to responsibility in the matter. The authors give a tabulation of the

results of tests made upon six samples purchased in the open market.—J. Am. Pharm. Assoc., 8 (1919), 811. (Z. M. C.)

Cobalt.—*Separation from Nickel.*—When to a mixture of cobalt and nickel salts ammonium chloride, ammonia water and hydrogen dioxide solution are added and when the mixture is heated, a compound of ammonium, chlorine and cobalt is formed. When the solution is neutralized with acid, cooled and then mixed with ammonium molybdate solution in excess, the cobalt is precipitated. The precipitate is collected on a filter, washed with water, dried at 110° and weighed as $\text{CoO}_3, 10\text{NH}_3, 6\text{MoO}_3$.—Pharm. Weekblad, 56 (1919), 979. (H. E.)

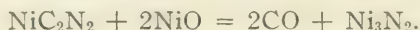
Cobalt.—*Colorimetric Assay of.*—G. Jones estimates small amounts of cobalt colorimetrically in the presence of other metals by means of Atack's reagent, adding ammonium citrate to the ammoniacal solution to be tested and then α -nitroso- β -naphthol.—Analyst; through Pharm. Weekblad, 56 (1919), 468. (H. E.)

Nickel.—*Allotropic Transformation of.*—Nickel becomes magnetic at about 350° , and this transformation is associated with changes in the electric resistance and in other properties, also probably in length though not in form of crystallization, as to which allotropic forms of other metals frequently differ. The change in length had so far not been actually established, but Prof. Jänecke has succeeded in demonstrating it with the aid of a testing machine. He placed the cylindrical specimen—45 cm. in height—between two pressure plates, kept the lower plate fixed and observed the movement of the upper plate when the specimen was heated by means of an electric furnace surrounding it. Readings could be taken within 0.007 mm. and temperatures were determined with the help of a gold and constantin thermocouple. The expansion curve consisted of two straight lines meeting near 350° and at an obtuse angle above that temperature. The rate of expansion was more rapid. A jump of 0.01 mm. was observed between 347° and 356° and a rod of nickel 5 in. long should in passing from α -nickel to β -nickel increase by about 1 mm. The method is recommended for observing both gradual and sudden transformation.—Engineering; through J. Ind. Eng. Chem., 11 (1919), 590.

Cobalt and Nickel.—*Rapid Assay of.*—Schoellen and Powell precipitate cobalt and nickel by adding solid potassium iodide to a

strongly ammoniacal tartrate solution. Manganese is estimated colorimetrically in the cobalt precipitate if in small quantities. If there is much manganese, it must be eliminated by precipitating the nickel and cobalt as sulphides or xanthates.—Chem. News, 118 (1919), 297.

Nickel and Cobalt Nitrides.—A. C. Vournasos prepares these nitrides by heating in the electric arc, the cyanide and the oxides of the appropriate metal; the reaction in the case of nickel being



These nitrides are not attacked by boiling water but are decomposed by fusion with caustic soda, with the evolution of ammonia. Compt. rend.; through J. pharm. chim., 20 (1919), 102.

PLATINUM METALS.

Platinum.—*Production in America.*—As the Russian output of platinum fell from 300,000 oz. in 1911 to 78,000 oz. in 1916, the American deposits were exploited to a greater extent, and their production rose, in the district of Choco, Columbia, from 12,000 oz. in 1911 to 50,000 oz. in 1917.—Chem. and Drug., 91 (1919), 947. (K. S. B.)

Platinum.—*Production in Westphalia.*—Shortly before the war it was discovered that there were large quantities of platinum in the districts of Olpe and Siegan in Westphalia and in the Westerland. At the outbreak of war the capital necessary for exploitation had not been raised. Capitalists have now been found, however, who are prepared to finance the exploitation of the platinum in the districts mentioned. Should the venture prove successful a new industry will be established which will be a compensation for the loss of the potash mines in Alsace.—J. Ind. Eng. Chem., 11 (1919), 1158.

Platinum.—*Production in Spain.*—Following upon some prospecting work undertaken at the initiative of the Spanish Government after three years' research in various directions, it has been found that platinum exists in Serrana de Rhonda to an extent of 2 to 3 grammes per meter. Serrana forms a chain of volcanic mountains extending over a distance of 1400 sq. km., hence the

beds surpass the platinum found in the Ural mountains, where the beds cover an area of only 50 sq. km. It may also be mentioned that the deposits in the Urals never yielded more than $\frac{1}{4}$ gramme per meter and, in addition, the beds there are getting exhausted.—Engineering; through J. Ind. Eng. Chem., 11 (1919), 688.

Platinum.—*Uses in Peace-Time.*—Some interesting facts concerning the world platinum situation were set forth by the chairman of a British gold and platinum corporation in London recently. Among other things it was stated that there is no precious metal in such demand for purposes connected with scientific manufacturing processes, to many of which it is essential in times of both peace and war. The pre-war uses of platinum were for jewelry, dentistry, and the leading in wires of electric bulb lamps, crucibles, thermocouples, and, on a small scale at that time, for the contact points of magnetos and the manufacture of fuming sulphuric acid. The world's production then was about 300,000 ounces, and the market price was about \$45 per ounce. Government action practically put an end to the use of platinum—that is, platinum ingots—in jewelry, dentistry, and for other uses not connected with the war. Owing to the war its use in magnetos for the engines of airplanes, hydroplanes, tanks, motor cars, motor boats, etc., was greatly increased. The increase in the production of fuming sulphuric acid, a basis of high explosives, was also very great. In the manufacture of the last-named chemical platinum is employed as a “catalyzer” or changer. According to the chairman, the war having ended, it would seem to follow that the requirement of platinum in the manufacture of fuming sulphuric acid would be considerably reduced, but such is not the case with regard to its use in connection with gasoline engines. There are many new uses. For instance, as a “catalyzer” platinum and its allied metal, osmium, are required in another industry of vast and far-reaching importance to the human race—the production of ammonia from the air—atmospheric nitrogen—to convert which into nitric acid heated platinum is also required. So here we have other peace uses for platinum of tremendous importance.—Pharm. Era, 52 (1919), 44.

Potassium-Platinum Chloride.—*Rapid Method of Reducing.*—Horsch directs washing the double salt with 80 per cent. alcohol,

dissolving it in hot water and transferring the solution to a tared platinum crucible. Two to three mls of alcohol are then added and the mixture is heated on a boiling water-bath when after one minute the platinum is deposited on the bottom and the sides of the crucible. The reduction is finished after heating for about 25 minutes. The liquid is then decanted, the crucible washed with water and heated to constant weight. The reduction, which takes place only in a platinum crucible and not in a porcelain crucible, is more rapid than that with formaldehyde. The concentration of the solution of the double salt should not exceed 0.25–0.3 per cent.—*Compt. rend.*; through *Pharm. Weekblad*, 56 (1919), 1009. (H. E.)

Platinum-Gold Crucibles.—*Action of Alkalies on.*—Nicolardot and Chatelot experimented to find out whether new platinum is less attacked than old platinum when alkalies are fused with it, and whether the presence of iridium increases or decreases its resistance to the same alkalies. The fusions were all carried out similarly, 5 grammes of alkali being used, and the process occupied ten minutes, the source of heat being a spirit lamp. The crucibles were first weighed, then the fusion was carried out, and they were then washed with water and dried. They were found to have lost weight, and their clean shining surface had been blackened. This black deposit disappears on treatment with hydrochloric acid. The loss of weight of metal is considerable, and is always greater when potash is used than with soda. New crucibles are more resistant than old ones, and the presence of iridium does not increase the resistance, but rather the reverse. The presence of copper does not seem to be as deleterious as that of iridium.—*Bull. soc. chim.*; through *Chem. News*, 118 (1919), 179.

Platinum Substitutes.—For the manufacture of cathodes Nicolardot and Boudet recommend an alloy consisting of nine parts of gold and one part of copper, in place of platinum. A cathode, weighing 23.5 grammes, lost only one milligramme in weight during twenty estimations of different types. Anodes may be made of the same material, but should be electroplated with a thin layer of platinum.—*Bull. soc. chim.*; through *Drug. Circ.*, 63 (1919), 285.

L. J. Gurevich and E. Wichers report on the results of experiments carried on by them, as follows: Three alloys of gold-palladium were subjected to the tests, namely Palau metal, gold 80 per cent. and palladium 20 per cent.; Rhotanium A metal, gold 90 per cent. and palladium 10 per cent.; and Rhotanium B metal, gold 70 per cent. and palladium 30 per cent. In regard to its resistance to loss on heating, Rhotanium A ware was found to be superior to platinum of both high and low iridium content. Its resistance to boiling hydrochloric acid, hydrofluoric acid, solution of sodium hydroxide, 20 per cent. was about the same as for platinum. Fusion with sodium carbonate and potassium pyrosulphate gave similar results as platinum. In its resistance to boiling sulphuric acid, it was found superior to platinum, but is inferior to platinum in its resistance to nitric acid, solution of ferric chloride, and fusion with sodium hydroxide. Rhotanium ware cannot be heated above 1100° without undergoing material change. Utensils made of palau and rhotanium C, exhibited practically the same resistance to reagents as did the Rhotanium A ware, except that they are unsuited for fusions with potassium pyrosulphate.—J. Ind. Eng. Chem., 11 (1919), 570. (G. C. D.)

Illium.—*A Platinum Substitute.*—A metal that can be substituted for platinum or gold in acid tests is announced by Prof. S. W. Parr, University of Illinois Department of Chemistry. He calls it illium and estimates the cost at 25 cents an ounce. The new metal can be machined like platinum. It is an alloy.—Pharm. Era, 52 (1919), 326.

Platino.—*Composition of.*—Platino is an alloy of 89 parts of gold and 11 parts of platinum—Chem. and Drug., 91 (1919), 1143. (K. S. B.)

ORGANIC CHEMISTRY

GENERAL SUBJECTS.

Aldehydes.—*Color Test for.*—Finding that the Fletcher-Hopkins thiophene test for lactic acid was due to the breaking up of the acid into formaldehyde and acetaldehyde, W. R. Fearon has modified it to apply as a general test for aldehydes. He adds to 5 mls. of

nitrate- and nitrite-free sulphuric acid, 2 drops of 0.2 per cent. alcoholic thiophene solution and then adds to the mixture 1 drop of the suspected solution. If aldehydes are present, a red color develops. The test shows aldehydes in a dilution of 1 in 100,000. —Biochem. J.; through Chem. Abstracts 13 (1919), 1480.

Aldehydes and Ketones.—*Volumetric Assay of.*—L. Lautenschlaeger treats the aldehyde or ketone with a definite excess of a standard solution of hydrazine sulphate and titrates the residual hydrazine with tenth-normal iodine V. S. Four atoms of iodine equal 1 molecule N_2H_4 or 2 molecules of the aldehyde or ketone. In the titration aldazines, oximes and hydrazones, the aldehyde must be set free by mixing with diluted sulphuric acid and driving the free aldehyde with steam over into the hydrazine sulphate solution. The article describes the vanillin assay of vanilla beans, of cinnamic aldehyde in cinnamon bark and oil, of carvone in oil of caraway, of aldehydes in oil of orange and of camphor in spirit of camphor.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1360.

Aromatic Compounds.—*Synthesis from Fatty.*—T. Komrinos reports that when malonyl chloride reacts with acetone in presence of marble two substances are obtained—phloroglucin and a compound of formula $Cl.CO.CH_2.COCH_2.CO.CH_3$, which is readily transformed into phloroglucin, losing a molecule of hydrochloric acid under the action of marble. The constitution of phloroglucin is thus verified and an easy method of passing from fatty to aromatic compounds is provided. It seems probable that the synthesis can be generalized.—Compt. rend.; through Chem. News, 118 (1919), 83.

Aromatic Ketones.—*Pungency of.*—Substances of the type $C_6H_5CH:CH.CO.R$ and $C_6H_5CH_2.CH_2.CO.R$, where one or more of the hydrogens of the benzene nucleus are substituted by one or more hydroxy or methoxyl groups, and where R represents a methyl ethyl or phenyl radicle, are described by Leonore Kletz Pearson. These substances are produced by the condensation of ketones of the type $CH_3.CO.R$ with substituted benzaldehydes by means of alkali: $C_6H_5CHO + CH_3.CO.R = C_6H_5CH:CH.CO.R + H_2O$. The author points out that many substances are more pungent in dilute solutions than *per se*, piperine being pungent when

diluted one part in 500,000 of aqueous alcohol, but not when placed on the tongue alone. The author sums up her results as follows:

1. The primary unsaturated condensation products, with the exception of *o*-hydroxystyryl methyl ketone, are not pungent *per se*, but develop pungency slowly, as a rule, in alcoholic solution. The corresponding saturated compounds, with the exception of 3:4-di-oxy-methylenephenylethyl methyl ketone, which develops no appreciable pungency *per se*, the pungency develops quickly both alone and in alcoholic solution. In all cases the unsaturated ketones were more pungent than the corresponding saturated compounds.

2. The replacement of the hydrogen of the phenolic hydroxyl group of zingerone by an acyl radicle appears to have little effect on the pungency of the compound. The replacement of the *meta* hydrogen of the benzene nucleus in *p*-hydroxyphenylethyl methyl ketone by a methoxy group or a bromine atom decidedly increases the pungency. The replacement of the hydrogen in the *meta* hydroxy group in (3:4)-dihydroxystyryl methyl ketone by methyl greatly increases the pungency.

3. An increase in the weight of the side chain increases the pungency decidedly.

The exceptional pungency of *o*-hydroxystyryl methyl ketone is commented upon. The pungency is determined by making series of dilutions in alcohol or alcohol and water. With the stronger alcoholic solutions, a few drops are placed upon the tongue, the pungency becoming evident upon the evaporation of the alcohol. A quantity of the weaker alcohol and water solutions is placed in the mouth and allowed to remain there three seconds. The dilution is continued until the pungency is just perceptible. The dilutions in which various aromatic ketones are pungent are given. —Chem. and Drug., 91 (1919), 824-6. (K. S. B.)

Aromatic Selenium Compounds.—F. L. Pyman desiring to study the action of selenium compounds similar in structure to sulphanilic and phenylarsenic bodies, prepared successively:

1. *Meta*-nitrophenylselenous acid, $C_6H_4(NO_2)(SeO_2H)$ 1:3, made by treating phenyl-magnesium bromide with selenium and then oxidizing the resulting selenophenol with nitric acid.

2. *Meta*-nitrophenyldiselenide, $(NO_2C_6H_4Se)_2$, by treating "1" with sodium bisulphite.

3. *Meta-aminophenyldiselenide*, $(\text{NH}_2\text{C}_6\text{H}_4\text{Se})_2$, by reduction of "2" with sodium sulphide and hydrochloric acid.

4. *The diacetyl compound of "3,"* $(\text{CH}_3\text{CONHC}_6\text{H}_4\text{Se})_2$, by treating "3" with acetic anhydride.

5. *Meta-acetylaminophenylselenous acid*, $\text{CH}_3\text{CONHC}_6\text{H}_4\text{SeO}_2\text{H}$, made by oxidation of "4" with nitric acid.

6. *Meta-acetylaminophenylselenic acid*, $\text{CH}_3\text{CONHC}_6\text{H}_4\text{SeO}_3\text{H}$, made by oxidation of "5" with potassium permanganate.

7. *Meta-aminophenylselenic acid*, $\text{NH}_2\text{C}_6\text{H}_4\text{SeO}_3\text{H}$, made by treating the barium salt of "6" with sulphuric acid, occurs in crystalline needles containing 2 molecules of water. The compound dried at 100° , melts at 229° .

This body was made more directly by Pyman by treating meta-nitro-aniline with potassium selenocyanide, reducing the resulting meta-nitrophenylselenocyanide with tin and hydrochloric acid, and then converting the meta-aminophenyldiselenide, thus obtained, into the acid ("5") by the reactions given above.—*J. Chem. Soc.*, 115 (1919), 166.

Carbon Compounds.—*Nature of the Ethylenic and Acetylenic Linkings in.*—W. E. Garner states that the appearance or disappearance of unsaturated linkings in carbon compounds is almost always accompanied by either trans-additions or trans-elimination of the groups leaving or entering the molecule. Cis-reactions occur but rarely. The author explains this by applying Bohr's conception to the carbon linking, assuming the presence of electrons rotating around the lines joining the centers of the carbon nuclei.—*Chem. News*, 118 (1919), 16. (J. H.)

Halogens.—*Cleavage in Organic Compounds.*—H. Kunz-Krause has studied the trihalides, fluorform, chloroform, bromoform and iodoform, with special reference to incompatibilities. Thus, in the preparation of an ointment from iodoform, silver nitrate, Peru balsam and zinc salve, a violent explosion occurred when the iodoform and the silver nitrate were triturated together dry. In studying this and similar reactions, Kunz Krause found the explosion was due to the formation of trinitromethane and ozone and the interaction of these in a nascent state.—*Arch. Pharm.*; through *Chem. Abstracts*, 13 (1919), 1364.

Hübl Number.—*Study of Its Value.*—R. Huerre discusses the iodine absorption value of unsaturated organic bodies. He points

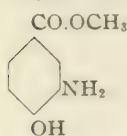
out that while the results obtained for fixed oils are fairly satisfactory, when the method is applied to volatile oils extremely discordant figures are obtained. Studying the absorption reaction from various angles upon fixed oils he concludes that the proportions of iodine solution and oil employed may be varied without serious effects on the iodine number. On the other hand, when coniferous volatile oils were studied, it was found that the marked differences in absorption were due to the proportions of iodine solution and the oil employed. He also found that the presence or absence of chloroform materially affected the iodine absorption, but that the question of time (after 1½ hours), of temperature and of concentration of the iodine solution affected results only slightly.

The article contains tabulated experimental data showing that the iodine absorption number of French oil of turpentine could be made to vary according to ratio in weight of the oil and the iodine employed from 313 to 420; of the oil of *Juniperus virginiana*, from 73 to 114; of pinene from 101.6 to 238; of cedrene, from 4.66 to 39.6; and of limonene, from 98 to 309. In the cases of maximum absorption, the amount of iodine employed was from 12 to 16 times as much as the amount of oil or hydrocarbon taken.

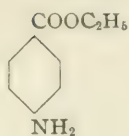
Huerre advises that the Hubl-Hanus determination should be revised with the view of finding out the optimum amount of iodine that should be added to each oil. He also recommends the establishment of what he calls the *pseudo iodine index* of volatile oils, the maximum amount of iodine absorbed after 2 hours contact, by 100 grammes of the oil or hydrocarbon from an alcohol solution containing the optimum amount of iodine and containing neither mercuric chloride nor chloroform, since he finds these two reagents affect the iodine reading.—J. pharm. chim., 20 (1919), 216, 250 and 273.

Local Anesthetics.—*Nitric Acid Color Test.*—Torald Sollmann has found that adding a drop of concentrated nitric acid to procaine, in dry powder on a white plate, is a delicate test for its purity. Some samples containing a rare impurity gave a deep rose color while pure samples were colorless or faintly tinged. The same test applied to other local anesthetics gave negative results except with orthoform-new. The structural formulas indicate that the positive reaction is probably due to the introduction of the OH group (possibly to the different position of the NH₂ group).

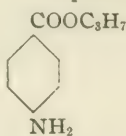
Orthoform-new



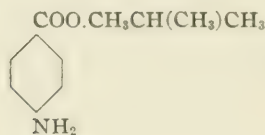
Anesthesin



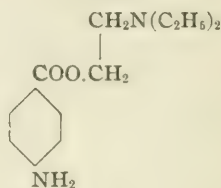
Propæsin



Cycloform



Procaine



—J. Am. Pharm. Assoc., 8 (1919), 458. (Z. M. C.)

Organic Liquids.—*Identification with "Dracorubin."*—K. Dieterich states that "*dracorubin*" is the name given to the portion of Sumatra palm resin (palm dragon's blood) which is insoluble in boiling light and heavy petroleum spirit. Test-papers are prepared by dipping strips of filter-paper, 7 by 1 cm., in an alcoholic or benzene solution of "*dracorubin*;" the strips are then dried. This test is carried out as follows: A stoppered cylinder, 10 cm. high and 3 cm. in diam., is nearly filled with the liquid to be tested and 4 strips of the paper are introduced; the appearance of the liquid is observed during the first 15 minutes; the tube is then shaken, set aside for 24 hours, and the papers removed. Various organic liquids have a different solvent action on the "*dracorubin*" and the coloration of the liquid and of the papers at the end of the test affords a means of identifying the liquid. For example, light petroleum spirit does not dissolve the substance and remains colorless; if the petroleum spirit contains a trace of benzene or alcohol, a red liquid is obtained. The coloration of the liquid and the appearance of the paper vary with the nature of the liquid under examination; these are described for such liquids as petroleum, benzene, formaldehyde solution, chloroform, turpentine, ether, ethyl acetate, toluene, xylene, carbon bisulphide, acetone, amyl alcohol, etc. In the "capillary" test, the paper is immersed to a depth of only 1 cm. in the liquid.—Ber. deutsch. Pharm. Ges.; through J. Soc. Chem. Ind., 38 (1919), 306A.

Organic Mercurials.—*Bibliography of.*—F. C. Whitmore of the University of Minnesota has prepared a most valuable bibliography

on this topic. Its scope may be realized when it is stated that the article gives over 900 references to the literature.—J. Ind. Eng. Chem., 11 (1919), 1083.

Organic Substances.—*Oxygen Assay of.*—In the analysis of organic substances the percentage of oxygen is generally calculated from the difference. R. Strebinger found that the oxygen can be estimated directly by boiling the substance with potassium iodate and strong sulphuric acid, by which the carbon is oxidized to carbon dioxide and the hydrogen to water. The excess of iodate is then titrated back in the usual way and from the amount of oxygen necessary to oxidize the organic substance and the amount necessary for converting the carbon into carbon dioxide and the hydrogen into water, the amount of oxygen present in the substance can be calculated. If for instance, it was found that for the complete oxidation of a carbohydrate 12 atoms of oxygen derived from the iodate are used, while for the complete oxidation of the same substance 18 atoms of oxygen are necessary, the substance must contain 6 atoms of oxygen. Halogens and sulphur do not interfere with the assay on, nor does nitrogen in the form of amino nitrogen which is converted into ammonia. It is to be taken into consideration that the calculation of the oxygen used for the combustion should not be based on $1/6$ KIO_3 as is done in the iodometric standardization. In the strong sulphuric acid solution I_2O_5 gives off SO_2 and is partly reduced to iodine, which after diluting the solution with water can be expelled by heating.—Ztsch. anal. Chem.; through Pharm. Weekblad, 56 (1919), 1290. (H. E.)

Organic Compounds.—*Relation of Constitution to Taste.*—The relation between the constitution of substances and their taste has always been of interest to the chemist and the physiologist. It has been well known for a long time that most of the acids taste sour. Previous to the advent of the dissociation theory, this fact was hardly associated with the presence of any one element or group. It is now pretty certain that the hydrogen ions are the essential constituent; at least they alone are common to all the acid possessing this quality. The ionic theory may account for the "salty taste" of sodium chloride, sodium sulphate and other sodium salts in a similar way. The peculiar taste of typically basic substances such as potassium hydroxide and sodium carbonate, is associated with the presence of the common hydroxyl ion. In

view of these facts and inferences Ernest Oertly and Rollin G. Myers thought it was logical to extend the analysis to organic compounds and try to discover the particular atoms or groups common to substances having a sweet or bitter taste. As a result of their work a theory has been worked out relating to the sweet taste of organic compounds to their constitution. The taste was found to be dependent on two factors. The *glucophores* make a given compound a potential taste stuff. If a glucophore is bound to any of the *auxoglues*, a sweet compound results. The article, which is a very interesting one, should be consulted in the original by those interested.—J. Am. Chem. Soc., 41 (1919), 855. (J. L. M.)

Organic Substances.—*Water Assay of.*—Five to fifteen grammes of the substance are heated with 200 mls of petroleum spirit, boiling point below 170° , in a wide-mouthed flask fitted with a Soxhlet-like apparatus having a side tube, but instead of the syphon the lower end of the body of the apparatus is constricted to a narrow tube graduated in tenths of a mil and sealed off at the lower end. The water and spirit distil off and condense into the wide body of the apparatus, and the water collects in the lower graduated part, where the quantity can be read off directly. The results agree with those obtained by direct distillation or drying in vacuo. Besson gives data obtained with samples of cheese and soap.—J. Soc. Chem. Ind.; through Pharm. Era, 52 (1919), 72.

Oxymethylantraquinones.—*Quantitative Determination of.*—The article describes a new method of determining the oxymethylantraquinones in such drugs as rhubarb, senna, etc. The method depends upon the hydrolysis of the glucosides of the above named quinones and this subsequent separation in such a pure state that they can be weighed.—J. Pharm. Belg.; through Pharm. J., 102 (1919), 250. (C. P. W.)

Synthetic Drugs.—*American-Made.*—Leech, Rabak and Clark report on the work which was done in the Chemical Laboratory of the American Medical Association in the efforts to overcome the shortage of synthetic drugs during the recent war. In particular they report on the examination of and the establishment of standards for procaine (novocaine), barbital (veronal), phenetidyl-acet-phenetidin (holocaine) and cinchophen, or phenylcinchoninic acid

(atophan), manufactured under Federal Trade Commission licenses. They report that the shortage of German synthetics was not felt seriously in most cases because the demand for them had been artificially created, and that the few which were in great need are being rapidly replaced by American made drugs. The report explains how the Federal Trade Commission granted licenses to American firms for the manufacture of German synthetics which were protected by U. S. patents, and how these licenses were issued only after an examination of the firm's product in the Association's Chemical Laboratory had demonstrated that its quality was satisfactory and equal to that of the drug formerly imported from Germany. It is interesting to observe, the report declares, that of all the synthetic drugs imported into this country from Germany and on which American patents had been issued, the demand was sufficient only to make it commercially profitable to manufacture four of them on a commercial scale, namely, arsphenamine (and neoarsphenamine), barbital (and barbital sodium), cinchophen and procaine.—J. Am. Med. Assoc., 73 (1919), 754. (W. A. P.)

Synthetic Medicines.—*Evaluation of.*—E. Rupp describes the methods he employs in assaying thiocol, sodium cacodylate, atoxyl, arsacetin, itrol and actrol. For details the original paper should be consulted.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1363.

Synthetic Medicines.—*Microchemical Detection of.*—A. Mayrhofer describes in detail tests for detecting acetanilide, acetphenetidine antipyrine and pyramidon.—Z. Oesterr. Apoth. Ver.; through Chem. Abstracts, 13 (1919), 2727.

Wij's Solution.—*Modified.*—E. Hildt urges modification in the formula for Wij's solution for determining iodine values. The modification consists in employing carbon tetrachloride in place of glacial acetic acid as the solvent for iodine chloride, and it is claimed that a solution much richer in iodine content is obtained. Carbon tetrachloride containing 1.137 per cent. of chlorine in solution will readily dissolve as much as 4.0367 per cent. of iodine as iodine chloride. The solution is perfectly stable if some dry fused calcium chloride is placed in the container. From one-half to two hours are required for complete absorption of the halogen, and the

results obtained checked up those found by the Huebl method.—*Chem. Zent.*, 90 (1919), 722. (G. C. D.)

Wood Distillation.—*Introduction into Italy.*—Large wood distillation works are being built at Palermo for the production of acetone, methyl alcohol and other chemical products from wood.—*Chem. and Drug.*, 91 (1919), 190. (K. S. B.)

HYDROCARBONS.

Coal Oil.—*Odorless.*—This is obtained by shaking 4.5 liters of the oil with 100 grammes of chlorinated lime and decanting the liquid into a vessel containing quick-lime, by which the chlorine is absorbed. After allowing the precipitate to settle the coal oil is decanted.—*Rev. chim. ind.*; through *Drug. Circ.*, 63 (1919), 504.

Gasoline.—*Effect upon Animals.*—The effect of gasoline vapors upon animals was investigated by "Abel Scholar," who found that it first caused a drunken dizziness and then death, to ducks. Moths were quickly killed without injury to their colors. The aphids of the rose-tree, and the blight of the apple-tree may be killed by cautious spraying, care being taken that the plant is not injured by too profuse application.—*Chem. and Drug.*, 91 (1919), 712. (K. S. B.)

Kerosene.—*Use for Insect Bites.*—Nona Allen states that immediate relief follows the application of kerosene to the so-called "bites" of the harvest bug, or mowers' mite (*Leptus autumnalis*). In California the mite is very prevalent among hay. The intense itching caused by the "insects" burrowing beneath the skin is often sufficient to incapacitate the victim from work. The intense irritation causes loss of sleep, and lesions are produced by scratching. All published remedies have proved useless; but the application of kerosene to the body before commencing work in the fields, changing the clothes when the day's work is over, and at once applying a little kerosene to any irritating spots as soon as observed, have given excellent results in alleviating the discomfort caused by this familiar seasonal pest.—*J. Am. Med. Assoc.*; through *Pharm. J.*, 103 (1919), 321.

Liquid Petrolatum.—*Danger in a War Substitute.*—Kraus reports a case where poisoning followed the injection of the prescription,

"hydrarg. salicyl., 1.0; paraffin. liq., 10.0." Investigation showed that the liquid petrolatum used was a war substitute made from brown coal and was not, of course, up to pharmacopœial requirements.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 1619.

Liquid Petrolatum.—*Iodine in.*—Several years ago the Chemical Laboratory of the American Medical Association conducted some experiments on the solubility of iodine in liquid petrolatum. It was found that a saturated solution was about 1.4 per cent. strong. Commercial articles frequently claimed 5 per cent. but never came up to that. A. H. Clark reports the result of further experiments, giving details of methods employed and tabulation of results with the following conclusions: A solution of iodine in liquid petrolatum is saturated when it contains about 1.4 per cent. iodine. The amount of iodine absorbed by liquid petrolatum, when in contact at room temperature for as long as seven months, or in contact at 100° for four hours or both, is relatively insignificant. All the absorption seems to take place during the heating and in the first month of contact.—J. Am. Pharm. Assoc., 8 (1919), 611. (Z. M. C.)

Liquid Petrolatum.—*Uses for.*—R. R. Lampa dwells upon the importance of mineral oil as a common remedy. He describes the proper method of use and gives some suggestions for further developing the sales of this preparation.—Pract. Drug., Nov. (1919), 24. (H. H. S.)

Methane.—*Synthesis and Properties.*—Malisoff and Eggloff have brought together the results of investigations upon methane, including the physical characteristics and chemical properties, and its synthesis and decomposition. A very useful part of the paper deals with research possibilities on methane. Many suggestions are made as to subjects and details which demand further or new research; these include the checking of some of the physical constants, oxidation, nitration, and sulphonation, the formation of derivatives by electrical methods, and the reactions of methane in the silent discharge with nitrogen, carbon monoxide, and various other substances. In all 53 different researches are tabulated, and some of them, if successfully accomplished, might lead to results of considerable practical value.—J. Phys. Chem.; through Chem. News, 118 (1919), 60.

Ozokerite.—*Sources of.*—In the eastern counties of England, a new bore made recently into the oil-shale field has met with an extremely rich formation which practically amounts to ozokerite or mineral wax. This is one of the more solid and, indeed, most valuable forms in which petroleum occurs. It is comparatively rare and the principal place where it is mined is at Boryslaw in Galicia. There are also ozokerite mines at one or two other points in that country. If reports are true, it probably means that the formation is of considerable volume. Further than that it is impossible to go, but facts are gradually accumulating which go to show that there lies beneath the surface of England a wealth of mineral oil and kindred deposits which has hitherto been unsuspected.—*Petroleum World*; through *J. Ind. Eng. Chem.*, 11 (1919), 1159.

Paraffin Hydrocarbons.—*New Reactions of.*—E. V. Lynn during the course of some experiments with nitrosyl chloride prepared a saturated solution of this gas in normal heptane. This solution so prepared was accidentally set in the sunlight for a day; when next observed the reddish brown color had changed to blue and there was a precipitate of white feathery crystals. The latter was found to be ammonia chloride. In a short time the blue color also disappeared, leaving the heptane colorless; and at the same time a heavy oil precipitated.

It has been found that petroleum ether (B. P., 45° to 70°) gives apparently the same reaction as does heptane. We may assume, therefore, that any of the liquid hydrocarbons will react in the same way.—*J. Am. Chem. Soc.*, 41 (1919), 368. (J. L. M.)

Petrolatum Pads.—These pads are prepared by cutting cheese-cloth, having preferably 24 threads to the inch, in strips 6 inches by 4 inches, turning one end up and dipping a set of twenty strips into hot petrolatum. The excess is allowed to drain off and the strips are placed in a tin box provided with a perforated lid. When the box is filled with strips, it is pinned up in a towel and sterilized in the operating room. The resulting pads are thoroughly saturated and adhere perfectly to the skin, allowing no Dakin's solution (a frequent cause of dermatitis) to penetrate.—*Brit. Med. J.*; through *Drug. Circ.*, 63 (1919), 106.

Petroleum.—*Composition of Some Asiatic.*—By a cryoscopic method, Chavanne and Simon have found that Persian petroleum

contains 17 to 19 per cent. of saturated cyclic hydrocarbons and that Borneo petroleum contains as much as 54 per cent. of such hydrocarbons.—*Compt. rend.*; through *J. pharm. chim.*, 20 (1919), 291.

Petroleum.—*Derbyshire.*—The petroleum oil recently struck at Hardstoft, in Derbyshire, is found to have the characters of a true paraffin base containing naphthenes. According to J. E. Hackford, its specific gravity is 0.823; setting point, 0° F.; viscosity (at 100° F.), 48 seconds. It gave 7.5 per cent. of motor spirit; 39 per cent. of kerosene; 30.5 per cent. of lubricating oils; 3 per cent. of paraffin wax; and 0.26 per cent. of sulphur. These figures closely agree with the predicted characters of the free petroleum obtainable in the forecast made in 1915.—*J. Soc. Chem. Ind.*; through *Pharm. J.*, 103 (1919), 3.

Petroleum.—*Genesis of.*—Chas. F. Mabery gives proof of the presence of nitrogen in petroleum of all the principal oil fields, in forms of combination that could have had their origin only in the remains of vegetable or animal bodies. Presumptive evidence has been shown that the associated hydrocarbons in petroleum had the same origin.

He also describes a special method of analysis for the determination of minute proportions of nitrogen in oils.—*J. Am. Chem. Soc.*, 41 (1919), 1690. (J. L. M.)

Sulphoichthyolate Preparations.—Preparations containing as their essential constituents salts or compounds of a mixture of acids containing sulphur and designated by the group name "sulphoichthyolic acid" are manufactured from certain bituminous shales. Sulphoichthyolic acid is characterized by a high sulphur content, the sulphur existing largely in the form of sulphonates, sulphones and sulphides. The ammonium compound of this sulphoichthyolic acid—first introduced as ichthyol—has been used extensively. The current estimate of the therapeutic effects of sulphoichthyolate preparations is based almost entirely on the use of ichthyol. As it is not known to what constituent or constituents of ichthyol such effects as it may have are due, the actions of ichthyol cannot be transferred to similar preparations which differ from ichthyol in their composition. The use of sulphoichthyolate

preparations is still largely empirical, and the evidence of their use unsatisfactory.

Ittiolo.—An ammonium sulphoichthyolate preparation manufactured from bituminous shales found in Giffoni Vallepiiana, Italy. Its composition closely resembles that of ichthyol. Since ittiolo closely resembles that of the original ichthyol, it is claimed that its actions and uses are also essentially those of ichthyol.—J. Am. Med. Assoc., 72 (1919), 345. (W. A. P.)

Xylol.—*Therapeutic Use of*.—Bory points out the powerful antiseptic properties of xylol, and refers to the excellent results which have attended its use in the prophylaxis of venereal disease, in civil and military practice. For the treatment of syphilitic lesions, as well as of certain skin affections, trichophytia and sycosis, he recommends an iodized-xylol ointment, containing 1 gramme of iodine dissolved in 15 to 20 mils of xylol, adding the solution drop by drop to petrolatum sufficient to make 100 grammes.—L'Union pharm.; through Chem. and Drug., 91 (1919), 1121.

VOLATILE OILS AND DERIVATIVES.

Volatile Oils.—*Antiseptic Value of*.—Saval reports on the examination of 45 volatile oils, comparing their antiseptic value with that of pure phenol. The test was carried out by inoculating neutral beef broth with polluted water which contained pathogenic germs in addition to saprophytes and adding to the bacterial flora a solution of the oil in a suitable solvent such as alcohol, acetone, etc. He found that the growth of the germs was retarded by a 0.56 per cent. solution of phenol, and that the same effect was obtained by a 0.07 per cent. solution of oil of thyme, a 0.1 per cent. solution of oil of organum, a 0.12 per cent. solution of oil of sweet orange, a 0.18 per cent. solution of oil of rose, a 0.2 per cent. solution of oil of clove, a 0.25 per cent. solution of oil of peppermint, a 0.3 per cent. solution of oil of gaultheria, a 0.42 per cent. solution of oil of anise, mustard or rosemary, and a 0.5 per cent. solution of oil of lavender. Some of the oils weaker than phenol were: Oil of lemon, 0.7 per cent. solution; oil of cajuput, 0.72 per cent. solution; oil of sassafras, 0.75 per cent. solution; oil of turpentine, 0.86 per cent. solution. Camphor retarded the growth of the germs when added to a 1 per cent. solution. Since saprophytes are more resistant against antiseptics than pathogenic germs the

actual antiseptic power of the oils is greater than that given.—*Compt. rend.*; through *Drug. Circ.*, 63 (1919), 105.

Volatile Oils.—*Physiological Action of.*—The relation between chemical constitution and physiological action was studied by S. Furukawa on a large number of perfumes and essential oils. Alicyclic alcohols, which contain the CHOH group and their esters, show a cooling taste. The lower aldehydes, alcohols and acids show cool, warm, and acidic tastes, respectively, and these tastes change to astringent in a higher homolog of each substance. Aromatic hydrocarbons and ketones show stimulus and bitter taste, respectively. A loach was kept in perfume solutions of various concentrations for 24 hours and the toxic and narcotic actions of the perfumes were observed. In a homologous series, the toxic effect is decreased with increasing molecular weight of the substance. The narcotic effect, however, is increased. In general, the total physiological action, that is, the sum of both toxic and narcotic effects, is proportional to the molecular magnitude, within a certain limit, above which the solubility in water or lipoids decreases suddenly. The author has extended his idea explicitly, on the theory of narcosis and also on the physiological meaning of perfume in a plant.—*J. Tokyo Chem. Soc.*; through *Pharm. Era*, 52 (1919), 149.

Oil of *Amorpha Fruticosa*.—*Constituents of.*—Shinozaki and Hoshino obtained by steam distillation of the dry fruit of *Amorpha fruticosa*, 11 per cent. of a pale yellow oil having the density 0.9126 at 15°; refractive index, $n_D = 1.5032$ at 20°; saponification value, 40.51. The oil consisted of one fraction (48 per cent.) boiling at 115–120° at 4 mm. pressure and another (23 per cent.) boiling at 120–125° at 4 mm. pressure. From these cadinene, another sesquiterpene and a sesquiterpene alcohol were obtained.—*J. Chem. Ind. Japan*; through *Chem. Abstracts*, 13 (1919), 361.

Oil of *Artemisia Annua*.—*Constituents of the High-Boiling Fractions.*—S. Takagi obtained from 500 grammes of the crude oil obtained from *Artemisia annua*, 52 grammes of a colorless oil boiling at 125° to 130° at 9 mm. pressure and 98 grammes of a light yellow oil boiling at 130° to 170° at 9 mm. pressure. The first fraction redistilled over sodium gave chiefly, at 8 mm. pressure, a fluid boiling at 122–123°, having the density 0.89416 at 14°; the

refractive index $n_D = 1.50435$ at 14° and the optical activity $\alpha_D = -87.65^\circ$ at 13° . Analysis showed it to be $C_{15}H_{24}$, and from it were obtained cadinene hydrohalides and isocaryophyllene hydrate; from the second fraction there was obtained a sesquiterpene alcohol ($C_{15}H_{23}OH$ or $C_{15}H_{25}OH$), boiling at $168-171^\circ$ at 15 mm. pressure.—J. Pharm. Soc. Japan; through Chem. Abstracts, 13 (1919), 163.

Bay Oil.—*Quality of Fiji.*—Bay oil from the Fiji Islands is frequently prepared from mixtures of the leaves of *Pimenta acris*, with those from *P. citrifolia* and *P. anise*. One such sample had the odor of both bay and anise and had the density 0.961; optical rotation $-1^\circ 58'$; was soluble in an equal volume of alcohol; contained only 23 per cent. of phenols, and was rich in methyl esters.—Bull. Imp. Inst.; through Chem. Abstracts, 13 (1919), 499.

Bay Oil.—*West Indian.*—J. Jones reports on two samples of oil from varieties of *Pimenta acris*, namely, Bois d'Inde Citronelle, grown in Dominica. The latter variety contains a smaller percentage of phenols, and has a strong odor of citral, and the suggestion is made that it may have some commercial value in the manufacture of toilet preparations.—Rep. Agr. Dept. Dominica, 1919, 5. (Bot. Abstracts.)

Bay Oil and Thymol.—*Production in Montserrat.*—In 1917 the experimental bay-tree plantation yielded 71 lbs. of oil per acre, an average yield of 17.8 oz. per 100 lbs. of green leaves, compared with 17.3 oz. in the previous year. There was a further improvement in the quality of the oil, the average specific gravity and phenol content, according to F. Watts, being 0.9441 and 55 per cent., respectively, as against 0.9351 and 50.9 per cent. in 1914-16. Further trials were carried out with ajowan (*Carum copticum*), but owing to unfavorable rainfall the results were not so good as in previous years. Yields of 471 lbs. and 360 lbs. of cleaned seeds per acre were obtained on two separate plots, and these gave on distillation 2.7-3.0 per cent. of oil having the following characteristics: Specific gravity 0.9112, refractive index 1.502, phenols 47.3 percent., thymol recovered 43.5 per cent. The oil was therefore similar to commercial ajowan oil. The oil obtained by the distillation of the stems and seeds of the plant was very inferior in quality, and contained but little thymol.—Perf. Essent. Oil Rec.; through J. Soc. Chem. Ind., 38 (1919), 738A.

Oil of Cade.—*Comparison of It and Its Substitutes.*—R. Huerre in 1915 (see YEAR BOOK, 1916, 309) submitted the wood of *Juniperus oxycedrus* to steam distillation and reported on the constants of the volatile oil thus obtained. He now reports on the empyreumatic oil obtained from batches of the same wood and also from the wood submitted to steam distillation in the experiments of 1915. Furthermore, he prepared empyreumatic oils from the wood of *Juniperus virginiana* and of *Cedrus libani*, calling the last two oils *Virginol* and *Libanol*, respectively.

The author finds that the best means of establishing the value of oil of cade are by the determination of the iodine number, the saponification number and by a study of the products obtained by the distillation of the oil with steam. Complete data of this character are given in the paper regarding the four types of oil studied. He finds there is a marked analogy existing between the character of the terpenes in the oil of *Juniperus oxycedrus* obtained by steam distillation and those found in the empyreumatic oil. Thus the empyreumatic oil from the wood that had been steam-distilled was not markedly different from true oil of cade.

As to the empyreumatic oils from *Juniperus virginiana* and from *Cedrus libani*, these, while showing similar color reactions, distinctly differ from true oil of cade in their distillation fractions and in the character of the residual tars. There is a distinct difference in the iodine number of oil of cade and that of "libanol," but the iodine number of "virginol" is not markedly different from that of true oil of cade.

The author notes that when the iodine number of terpenes is taken, the iodine does not combine with the terpene as it does with the unsaturated constituents of fats. He therefore suggests that in such work, the sample shall be allowed to stand the days or weeks necessary to liberate the iodine from the compound, taking up the freed iodine from time to time, with sodium thio-sulphate. He therefore proposes that account be taken of this iodine liberation and that a "stabilized iodine number" be established.—J. pharm. chim., 19 (1919), 33 and 65.

Cajuput Oil.—*Macassar Exports.*—The exports of cajuput oil from Macassar during 1918 amounted to 15,000 kilos, against 38,000 kilos in 1917. In 1918, 8,000 were shipped to Singapore and 4,000 to the United States (against 21,000 kilos in 1917), 2,000 kilos to Japan, and 1,000 kilos to Hong Kong.—Chem. and Drug., 91 (1919), 511. (K. S. B.)

Camphor.—*Production in Formosa.*—During the year 1917–1918 Formosa produced 60,000 piculs of camphor, compared to 89,000 piculs the preceding year, and Japan produced 20,000 piculs, just half of the preceding year's output. Only 8,000 piculs were exported, although foreign refiners and celluloid manufacturers required at least 72,000 piculs. During the first eight months of 1918 the total exports of camphor amounted to 1,422,222 kin, of which 31,700 kin went to British India, 345,000 kin to Great Britain, 31,000 kin to France, and 474,000 kin to the United States.—Chem. and Drug., 91 (1919), 1046. (K. S. B.)

Camphor.—*Production in Taiwan.*—J. F. Abbott, reporting on the decline in the production of camphor in Taiwan during the past three years, sums up the reasons as follows: 'There is a shortage of labor to gather the crude material, due partly to the higher wages paid by other industries, especially the sugar industry, and partly to the necessity of going farther and farther into districts menaced by savages in order to get good trees. Laborers prefer to work in safe industries, since the wages they can receive are equal to or even greater than the wages paid in this comparatively dangerous occupation. Good trees have become scarce because of the wanton and unorganized cutting down in the past. The companies from which the Monopoly Bureau obtains the raw product naturally desired to procure the largest quantity of camphor at the smallest expenditure of time and labor. This led to a great deal of waste, only such parts of a tree as gave the largest yield being utilized, while the branches, twigs, and roots were simply neglected.

To systematize the method of gathering the camphor and to prevent waste, these camphor companies have recently amalgamated into one large concern.—Pharm. Era, 52 (1919), 242.

Camphor.—*Solubility in Water.*—Leo and Rimbach find that the solubility of camphor in pure water is 1 part in 598. In Ringier's solution it is 1 in 577. The solubility in water falls with rise of temperature.—Biochem. Zsch.; through J. Soc. Chem. Ind., 38 (1919), 738A.

Camphor.—*Use in Influenza.*—During the outbreak of influenza at Felixstowe, Giuseppi treated 250 cases with camphor, with a

mortality of one. In another series of 200 cases during the same outbreak, and untreated with camphor, the mortality was 2 per cent. The incidence of broncho-pneumonia in the first series was 10 per cent., in the second 8 per cent. The treatment consisted in the administration of pills containing 4 grains of camphor made up with soap, in mild cases three times daily, and in the very acute cases every three hours. Treatment was continued until the temperature dropped and the signs of bronchitis or broncho-pneumonia cleared up.—Brit. Med. J.; through Chem. and Drug., 91 (1919), 453.

Monobromated Camphor.—*Assay in Migraine Tablets.*—W. O. Emery proposes a method for the quantitative determination of camphor monobromate based on the treatment of an aqueous-alcoholic solution of the substance with sodium amalgam forming sodium bromide which may then be determined gravimetrically as silver bromide.

Briefly the method is as follows: A sample is taken equivalent to 100 to 200 mgm. of the camphor monobromide treated with 20 mls alcohol and 10 mls water in a small round-bottomed flask, containing 15 grammes of 1 per cent. sodium amalgam, and boiled gently for $\frac{1}{2}$ hour under a reflux condenser, the condenser tube is then washed out with 5 mls alcohol, then with 5 mls water, receiving the washings in the flask. The flask is then heated on water-bath for 1 hour or until the evolution of hydrogen has about ceased. Transfer to separatory funnel, draw off the mercury and wash with water, filter and make filtrate acid with nitric acid and precipitate with silver nitrate solution. The weight of silver bromide multiplied by the factor 1.23 will give the quantity of camphor monobromide originally present in the sample.—J. Ind. Eng. Chem., 11 (1919), 756. (L. A. B.)

Colloidal Camphorated Serum.—*Use in Influenza.*—A. Rémond reports that camphorated serum has been found of great value in influenza when administered intravenously. It is prepared by agitating 20 to 25 grammes of powdered camphor during 24 hours with 1 liter of Hayem's serum and then filtering and sterilizing. The finished product contains about 0.9 gramme of camphor in each 100 mls. Mixtures of colloidal metals in Hayem's serum were also found efficacious.—Rep. pharm.; through Chem. Abstracts, 13 (1919), 1618.

Oil of Camphor.—*Japanese Exports.*—The Japanese exports of oil of camphor for the past three years were as follows: 1916, 1,971,680 kin; 1917, 1,713,633 kin; 1918, 1,370,869 kin.—Chem. and Drug., 91 (1919), 363. (K. S. B.)

Oil of Canada Balsam.—Max Philips gives the results of some experiments on Canada balsam. The commercial balsam was subjected to steam distillation and then the oil was fractionated. Although the oil is reported to contain about 50 per cent. of pinene, this fractionation revealed only a small amount in the fraction distilling between 153° and 158°. The boiling points of certain fractions and the benzylamine base of fraction, 173–178°, indicate the presence of at least one other terpene.—J. Am. Pharm. Assoc., 8 (1919), 175. (Z. M. C.)

Oil of Chenopodium.—*Administration of.*—The dose of oil of chenopodium for children is one drop for every year of age. Since the worms are only paralyzed by the oil and not killed and since the oil is liable to irritate the intestinal mucous membrane, a laxative should be administered together with the oil.—Correspondenzbl. Schweiz. Aerzte; through Pharm. Weekblad, 56 (1919), 525. (H. E.)

Oil of Chenopodium.—*Composition and Anthelmintic Value.*—Hall and Hamilton distilled oil of chenopodium at 25 to 30 mm. pressure and obtained five fractions, the yield and rotation of which were:

	Yield.	Rotation.
85 to 100°	20	—13.9°
100 to 110°	25	—6.6°
110 to 145°	30	—1.2°
Above 145°	25	—1.1°

The original oil had the rotation —6.2°.

A sample of Schimmel and Co. oil having the density 0.957 and the rotation of —6° gave fractions, the density and rotation of which were:

	Yield.	Rotation.	Density.
85 to 100°	24	—13.4	0.901
100 to 110°	22	— 7.3	0.933
110 to 120°	26	— 2.6	0.993
Above 120°	20	— 1.5	1.030

While the commercial is a potent and valuable anthelmintic, it frequently acts as a gastrointestinal irritant, the irritating action seeming to be due to the undistilled fraction, remaining after the oil has been distilled up to 125° at 30 mm. pressure. It is therefore advisable to use instead of the whole oil, the fractions boiling below 125° (30 mm.), as these are more anthelmintic than ascaridol and are much less irritating.—J. Pharmacol.; through Chem. Abstracts, 13 (1919), 2923.

Oil of Chenopodium.—*Danger in Uncinariasis.*—Roth reports untoward effects following the use of chenopodium oil in the treatment of uncinariasis, as observed by several physicians. One hundred and three patients were given the oil. Twenty-nine showed signs of reaction. Dizziness, nausea and vomiting, headache, deafness and general depression were the symptoms observed. Deafness is by far the most disagreeable after-effect of the chenopodium treatment. It occurs in 20 per cent. of all cases, varied in intensity from very mild to complete loss of hearing, and lasts anywhere from one week to several months. In four of the cases some deafness still persists two years after the date of treatment. No such reaction was observed after the administration of thymol in similar doses.—Southern Med. J.; through Drug. Circ., 63 (1919), 105.

Oil of Chenopodium.—*Effect on the Hearing.*—Oppikofer adds another to the four cases he has found on record in which bilateral deafness developed in consequence of poisoning from chenopodium. The two adults and three children affected all presented symptoms showing severe general poisoning, to which the adult who had taken the largest dose succumbed. The others recovered in a few days to two weeks. He reviews the literature on chenopodium poisoning, saying that in none of the other ten cases on record was the hearing mentioned, so presumably the drug did not induce deafness. Staggering, extreme vertigo and inability to stand without support were recorded in the cases with deafness, suggesting impairment of the vestibular as well as of the cochlear functioning. The optic nerve seems to be more resistant to the poison than the nerve of hearing. In only one of the total fifteen cases of chenopodium poisoning were visual disturbances noted.—Correspondenzbl. Schweiz. Aertze; through Drug. Circ., 63 (1919), 229.

Oil of Chenopodium.—*Use as Veterinary Anthelmintic.*—Stall, Wilson and Wigdor state that the intestinal sclerostomes or strongyles of the horse are difficult to expel. Ferrous sulphate and tartar emetic are of little use in this respect, while the latter is apt to give rise to enteritis. Oil of turpentine (60 grammes, followed immediately by a litre of olive oil) is more active, a single dose causing the expulsion of about 50 per cent. of the parasites. Oil of chenopodium in doses of 16 to 20 mls is very efficacious, causing the expulsion of over 95 per cent. of the parasites. Half these doses of the oil produce little effect. It is therefore concluded that oil of chenopodium is the best anthelmintic against equine intestinal strongyles, and that turpentine comes next to it.—J. Am. Vet. Assoc.; through Pharm. J., 103 (1919), 3.

Oil of Chrysanthemum Marginatum.—Y. Shinosaki obtained by steam distillation of isokiku (*Chrysanthemum marginatum*), 0.005 per cent. of a greenish blue oil was obtained, having the following constituents: Specific gravity 0.9231 at 15° C., $n_{20} = 1.5020$, $[\alpha] = -46.58^\circ$, saponification value 16.30, ditto after acetylation 63.09. Besides esters and alcohols, a small quantity of aldehyde or ketone giving a crystalline bisulphite compound, was present.—J. Chem. Ind. Tokyo; through J. Soc. Chem. Ind., 38 (1919), 877A.

Citronella Oil.—*Formosan.*—S. Furukawa has compared Formosan citronella oil with that from Java and from Ceylon. He finds Java citronella oil is yellow-brown, sweet in odor, has a density 0.8919 at 15°; dissolves in 80 per cent. alcohol (in proportion of 1 volume in 6); has an acid number, 1.6; ester number, 34.4; geraniol content, 93.97 per cent. The Ceylon oil was yellow-brown, less fragrant, had the density, 0.9049 at 15°; acid number, 1.5; ester number, 39.2; geraniol content, 58.6 per cent. The Formosa oil was yellow-brown, had a density, 0.9601 at 15°; acid number, 0.4; geraniol content, 22.16; citronellal content, 11.05. From these figures the author concedes the inferiority of the Formosan oil to that coming from Java and Ceylon. From Java oil, Furukawa isolated eugenol and chavicol and three acids, one of which was citronellic acid.—J. Chem. Ind. Japan; through Chem. Abstracts, 13 (1919), 1897.

Citronella Oil.—*Geraniol Assay of.*—A. W. K. de Jong discusses the assay of oil of citronella with phthalic anhydride. He finds

citronellal is scarcely attacked by phthalic anhydride; that at temperatures between 77° and 99° only about 92 per cent. of the geraniol is esterified; that complete esterification is not possible without the addition of sodium acetate.—Proc. Acad. Sci. Amsterdam; through Chem. Abstracts, 13 (1919), 1366.

Coumarin.—*Adulterated.*—Discussing the adulteration of coumarin with terpin hydrate (See YEAR BOOK, 1918, 417) it is pointed out that this adulterant may be detected by heating with 20 per cent. sulphuric acid (odor of terpineol) or with concentrated sulphuric acid (red color). Acetanilid may be detected by the chlorinated lime test, the permanganate tests and the chromium trioxide test.—Perf. Essent. Oil Rec.; through Chem. Abstracts, 13 (1919), 1895.

Oil of Cymbopogon Javanensis.—*Properties of.*—J. J. Hofman reports on the ethereal oil of *Cymbopogon javanensis*, a graminaceous plant belonging to the family *Andropogoneæ*, to which other species of *Cymbopogon* belong, which furnish palmarosa oil, citronella oil, lemon-grass oil, etc. The oil has the following constants: Specific gravity 0.9747; specific rotation -0.2054 ; refractive index 1.5135; acid number 1.25; saponification number 30.9; geraniol 48.2 per cent.; methylisoeugenol 30.5 per cent. The oil contained methyl vanillin, citral, free geraniol, citronellol and the formic, butyric, valerianic and caproic acid esters of the two alcohols. The hydrocarbon present in the oil consists of strongly levorotatory pinene.—Pharm. Weekblad, 56 (1919), 1279. (H. E.)

Oil of Dill.—X. Faucillon discusses the differences existing between the German and English oil of dill. He cites Umney's findings as to the physical constants of English oils showing that the density of such oils range from 0.902 to 0.9643, while their optical indices range from α_D , $+47^{\circ} 5$ to α_D , $80^{\circ} 25$, and then gives figures as to oils produced in Germany showing a range in density from 0.899 to 0.970 and in optical activity, from α_D , $+41^{\circ} 30$ to α_D , $+80^{\circ} 2$.—Perf. Essent. Oil Rec.; through Chem. Abstracts, 13 (1919), 1365.

Eucalyptol.—*Assay of.*—Bennett and Salomon state that in oils containing less than 85 per cent. of eucalyptol, 5 mls of phos-

phoric acid will suffice to complete the precipitation. If the eucalyptol content is above 85 per cent. 6 mils of the acid may be used, and higher results will be noted. The use of 7 mils of acid resulted invariably in low figures. With arsenic acid, the same results were obtained. With both arsenic and phosphoric acids the results, however, are low, owing no doubt to the decomposition of the arsenate or phosphate cake during pressure. Very low temperatures will minimize the error.—Perf. Essent. Oil Rec., 10 (1919), 211. (G. C. D.)

Oil of Eucalyptus.—*Use in Influenza.*—At a meeting of the Société de Thérapéutique Dr. Challamel recommended for influenza hypodermic injections of fixed oil containing oil of eucalyptus (huile eucalyptolée).—J. pharm. chim., 19 (1919), 270.

Oil of Eucalyptus.—*Danger in Use of.*—Barker and Rowntree call attention to evidences of poisoning by myrtol, a little known drug administered in the treatment of catarrhal conditions of the respiratory mucous membrane. This terpene-containing substance is obtained by distillation of the leaves of *Myrtus communis*, even as eucalyptol, the chief constituent of eucalyptus oil, is prepared from another genus, *Eucalyptus* of the same natural order of plants. A review of recorded cases of poisoning, unexpected and unaccountable or otherwise, with derivatives of these myrtaceous plants, reveals the occurrence of two somewhat distinct syndromes. In the one, designated myrtogenic neuropathy by the authors, the nervous system primarily is affected; in the other form, the myrtogenic dermatopathy, the skin chiefly is affected, with lesions that may be erythematous or urticarial in character.—Bull. Johns Hopkins Hosp.; through Drug. Circ., 63 (1919), 64.

Oil of Eucalyptus.—*Victorian Production.*—During 1918 806,977 lbs. of oil of eucalyptus was distilled from forest areas in Victoria, an increase of 360,640 lbs. over the 1917 output.—Chem. and Drug., 91 (1919), 273. (K. S. B.)

Eucalyptus Oils.—*Indian.*—T. P. Ghose obtained the oils from the leaves and young twigs of mature trees growing at Kaunli, Dehra Dun, India, by distillation in steam at 35 to 60 pounds pressure.

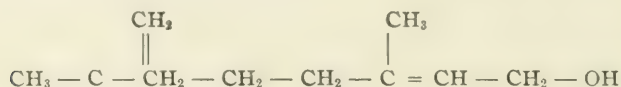
Eucalyptus tereticornis.—The material contained 22.75 per cent. of moisture, and yielded 0.86 per cent. (on the dry material) of oil. The redistilled oil was yellow, had sp. gr. 0.903 at 16°, $n_D^{16} = 1.4905$, $\alpha_D = -22.26^\circ$ in 100 mm. tube. The fraction distilling at 170–190° (53 per cent.) had sp. gr. 0.874 at 16°, $n_D^{16} = 1.4865$, and $\alpha_D = -8.56^\circ$ in 100 mm. tube. The fraction 170–190° contained about 10.4 per cent of eucalyptol, and the whole oil contained about 8.4 per cent. of aldehyde, but no phellandrene; alcohols and esters were also present. The oil dissolved in 1.9 parts of 80 per cent. and in 16 parts of 70 per cent. alcohol.

Eucalyptus crebra.—The material contained 33.0 per cent. of moisture, and yielded 0.46 per cent. (on the dry material) of oil. The redistilled oil had sp. gr. 0.899 at 16°, $n_D^{16} = 1.4673$, and $\alpha_D = -3.24^\circ$ in 100 mm. tube. The fraction distilling at 170–190° (43 per cent.) had sp. gr. 0.851 at 16°, $n_D^{16} = 1.4685$, and $\alpha_D = -21.04^\circ$ in 100 mm. tube. This oil contained no phellandrene and practically no eucalyptol, aldehyde, or ketone. It gave an opalescent solution with 15 parts of 80 per cent. alcohol. The oils are useless for medicinal purposes, but their odor is pleasant and they may find application in perfumery.—Perf. Essent. Oil Rec.; through J. Soc. Chem. Ind., 38 (1919), 477A.

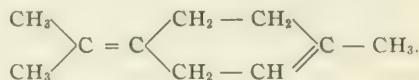
Eucalyptus Oils.—*Germicidal Activity of*.—R. Greig-Smith states that while eucalyptus oil as listed in *Materia Medica* is from *E. globulus*, many oils of other origin are sold under this name. The Baker and Smith classification of oils was followed by the author to determine the toxic effect of 40 to 50 specimens of crude and refined oils. *E. polybractea* (Blue Mallee), *E. cinerea* (Argyle apple), *E. australiana* (Narrow-leaf peppermint), and *E. dives* (Broad-leaf peppermint) are at present the chief sources of commercial oils in New South Wales. The test-organisms employed to determine the toxicity of the oils were *Micrococcus aureus* and *Bacterium coli communis* from serum suspensions. The activity and quality of the oil was found to vary strikingly even within the same tree and also with different specimens of a species. It was affected by altitude and growth conditions in general. On the whole these oils had lower toxicity than phenol. The results of the tests are given in nine tables. The main constituents seemed relatively insignificant with reference to toxic action. Bactericidal power was proportional to the acidity of the oil and assisted by, although not caused by it alone. The iodide reaction was no criterion as to the

germicidal value of the oils. The vapors of the oils had decided bactericidal action.—Proc. Linnean Soc., N. S. W., 44 (1919), 72. (Bot. Abstracts.)

Geraniol, Linalool and Nerol.—*Constitution of.*—M. Verley believes that geraniol, which is easily obtained by reduction of citral, possesses the formula:



and corresponds to citronellol. Two distinct isomeric forms exist of the substances of the geranic series which are found in nature, *i. e.*, geraniol, citral, linalool, and methylheptenone. The α form is much the most abundant; it is often accompanied by the β modification but the latter occurs in small quantities only. Only very small amounts of nerol occur. Nerol or β citral accompanies citral in oil of lemongrass, and isolinalool is similarly associated with ordinary linalool. Dipentene is easily obtained directly from geraniol by loss of water and closing of the chain, a reaction which is readily brought about by the action of certain dehydrating agents such as formic acid. As geraniol is the oxygen derivative which is most widely distributed in natural volatile oils where limonene also occurs in great abundance, it is possible that these two compounds are derived from one another. The terpene which corresponds to nerol is the terpinolene which is the β modification of the dipentene—



Like nerol, this terpene is rare. It is spontaneously transformed into dipentene in the cold, and rapidly when warmed to 230° in presence of water.—Bull. Soc. Chim.; through Chem. News, 118 (1919), 191.

Geranium Oils.—*Japanese.*—Of three Japanese geranium oils examined by S. Furukawa, that from *Pelargonium denticulatum* resembled foreign commercial oils in composition, the others being of inferior value as perfumes. The following figures were obtained.

	P. graveolens	P. radula	P. denti culatum.
Sp. gr.....	0.9178	0.9234	0.8860
Acid value.....	183.68	5.6	7.17
Ester value.....	4.8	31.7	12.8
Total geraniol %.....	23.1	26.3	63.5
Free alcohol % (as geraniol)....	22.0	17.26	60.0
Yield from fresh plant.....	1.75-2%	1.5%	5.0%

The chief constituents of the oil of *P. graveolens* were isolated: viz., *d*-citronellic acid (56 per cent.), *l*-menthone, and *l*-citronellol, —J. Chem. Ind., Tokyo; through J. Soc. Chem. Ind., 18 (1919), 656A.

Hemlock Oil.—*Camphene Present in.*—E. V. Lynn announces the discovery and identification of camphene in hemlock oil.—J. Am. Pharm. Assoc., 8 (1919), 104. (Z. M. C.)

Oil of *Jasminum Odoratissimum.*—The fresh flowers of shuei (*Jasminum odoratissimum*), which is cultivated in Formosa and used for perfuming tea, yielded on extraction by Tsuchihashi and Tasaki, with petroleum spirit 0.277 per cent. of "concrete essence," which was separated by maceration with alcohol into 0.116 per cent. of essential oil and 0.166 per cent. of "flower wax." The enfleurage process of extracting the essential oil was unsuccessful. The oil was a reddish brown liquid with the following characters: Sp. gr. at 15° 0.9309; $n_D^{15} = 1.4845$; α_D^{15} (100 mm.) = +5.64; acid value, 5.85; saponification value, 92.25; and saponification value after the acetylation, 186.20. By fractional distillation the oil was separated into a series of fractions boiling at 66° to 200°, in which the following constituents were identified: *d*-Linalool, 6 per cent.; *d*-linalyl acetate, 6 per cent.; benzyl alcohol, 1.6 per cent.; benzyl acetate, 6 per cent.; indol and methyl anthranilate, 10 per cent. In the higher fractions a substance which was probably a sesquiterpene alcohol or diterpene alcohol was separated. It constituted the main portion (57 per cent.) of the oil. Hesse's "jasmon" was not found in any fraction, and the characters of the oil were different from those of *Jasminum grandiflorum*, studied by Hesse and Müller. The flower wax had the following characters: Sp. gr. at 100°/15°, 0.8259; melting point, 45-47°; $n_D^{60} = 1.4622$; $[\alpha]_D^{18} = 0.11$; acid value, 1.25; saponification value, 67.53;

unsaponification matter, 67.07 per cent.; iodine value (Hübl), 100; and Reichert-Meissl value, 1.0. The unsaponifiable matter consisted mainly of triacontane, $C_{30}H_{62}$.—J. Chem. Ind., Tokyo; through J. Soc. Chem. Ind., 38 (1919), 117A.

Oil of *Juniperus Procera*.—A. F. Macculloch subjected the wood of *Juniperus procera*, grown in Nairobi, British East Africa, to steam distillation and obtained an oil having the odor of cedar wood and possessing the following physical constants: density, 0.987 at 15.5°; α_D , -16° at 20°; n_D , 1.480 at 25°; solubility, in 90 per cent. alcohol in all proportions, in 70 per cent. alcohol 1 in 60. The oil contained 38 per cent. of cedrol, in the form of white needle-shaped crystals melting at 75°. On the other hand, if the wood was exposed to the hot sun several weeks before distilling, the cedrol content of the oil was materially increased.—J. Soc. Chem. Ind., 38 (1919), 364T.

Oil of Lavender.—*Ethyl Ester as Adulterants of.*—M. S. Salamon points out that the ethyl esters obtained from the fatty acids of coconut oil are being at present used for the adulteration of lavender oil. They can only be detected with certainty by an examination of the fatty acids separated from the oil; a solid acid melting at about 30° can be isolated by the usual method when these esters are present in the oil. An indication of the presence of the esters is obtained by the production of a milky, instead of a clear solution, when liberating the fatty acids, but the usual constants of the oil reveal nothing abnormal even when as much as 3 per cent. of adulterant is present.—Perf. Essent. Oil Rec.; through J. Soc. Chem. Ind., 38 (1919), 553A.

Oil of *Leptospermum*.—An interesting paper was read before the Royal Society of New South Wales at a recent meeting by Challinor, Cheel, and Penford, on a new species of *Leptospermum*, closely allied to *L. flavescens*, var. *grandiflorum*, but differing from the latter by its more obtuse leaves, which have a distinctly fragrant citron-like odor, and the smaller flowers. It is found at Copmanhurst (N. S. W.) and at Springbrook, Macpherson Range (Queensland), and was first discovered by the Rev. H. M. R. Rupp in 1911. The essential oil distilled from 686 lbs. of leaves and terminal branches was investigated by the authors. The yield

amounted to 1.85 per cent. The crude oil is of a pale amber color, sp. gr. 0.8841, optical rotation $\alpha_D +3.6$ at 18° , refractive index $n_D^{20^\circ}$ 1.4730; it contained 90 per cent. of aldehydes and was soluble in 2 volumes of 70 per cent. alcohol. The oil possesses a strong, pleasant, modified lemon odor, and the investigation carried out in the research laboratory of Gillard Gordon, Ltd., Sydney, proved that it contained 90 per cent. of citronellal and citral in nearly equal proportions, and in this respect appears to occupy a position intermediate between the oils obtained from *Eucalyptus citriodorea* and *Backhousea citriodorea*, both of which give the highest recorded yields of the respective aldehydes citronellal and citral. The non-aldehyde portion of the oil is still under investigation by the authors, but appears to contain a small amount of phenol and also a small amount of an alcohol, apparently resembling geraniol or citronellol, while there is evidence of the presence of a small amount of aromadendrene.—Chem. and Drug., 91 (1919), 1025.

Linalool.—*Synthesis of.*—Ruzicka and Fornasir dissolve methylheptanone (from citral) in ether. This is mixed with sodamide, and submitted to a slow stream of acetylene, when a good yield of dehydrolinalool, $(CH_3)_2C:CH.(CH_2)_2.CCCH_3(OH).C:CH$, is obtained. This is reduced to linalool by shaking with sodium and moist ether.—Helv. Chim. Acta; through J. Soc. Chem. Ind., 38 (1919), 303A.

Oil of Meadowsweet.—*New Use for.*—Salicylic aldehyde, which, in its artificial form, is used as a substitute for the natural oil of meadowsweet, has been found to act as a reagent towards caustic alkalies and may be used as an indicator in, for example, the determination of salicylic acid. It has been found that the usual colorimetric method of estimating salicylic acid by means of ferric chloride fails in the presence of salicylic aldehyde, which also gives a coloration with ferric chloride. It is found, however, that the aldehyde yields a yellow color with caustic soda, so that salicylic acid may be titrated, in the presence of the aldehyde, with standard alkali, the aldehyde acting as an indicator. The procedure is as follows: The salicylic acid containing the aldehyde is extracted in the usual way with ether and the ethereal solution is shaken three times with 10 mls dilute sodium bicarbonate solution. The united extracts and washings are then titrated with

N/20 sulfuric acid until the yellow color, due to the action of the alkali on the aldehyde, is discharged, after drawing off the carbonic oxide, as it is formed, by boiling.—Oil Color Trade J.; through J. Ind. Eng. Chem., 11 (1919), 1065.

Menthol.—*Assay in Alcoholic Solution.*—H. V. Arny and Hugo H. Schaefer in a paper read before the 1919 meeting of the New York State Pharmaceutical Association describe a method for quantitatively "salting out" menthol from alcoholic solutions as follows. The alcoholic solution of menthol is poured into a cassia flask and enough 10 per cent. sodium chloride solution is added to bring the fluid well up into the neck of the flask. The temperature of the flask is kept at about 50°. The layer of liquid menthol is then read, a final reading being made after allowing to stand for 24 hours. The specific gravity of liquid menthol was found to be 0.847. Comparative assays on known samples were made and the data is recorded in the paper.—Pract. Drug., Aug. (1919), 28. (H. H. S.)

J. L. Mayer in a paper read before the New York State Pharmaceutical Association, describes a method for the assay of menthol in alcoholic solution. Into a tared Petri dish, 5 mls of the sample are measured and the dish is placed in a desiccator over sulphuric acid for one night. The alcohol will evaporate and the residue may be weighed as menthol. Accurate results by this method were obtained using known samples.—J. Am. Pharm. Assoc., 8 (1919), 572. (H. H. S.)

Menthol.—*Japanese Exports.*—The Japanese exports of menthol for the past three years were as follows: 1916, 386,458 kin; 1917, 251,210 kin; 1918, 237,311 kin. The destinations were as follows:

	(1916) kin.	(1917) kin.	(1918) kin.
British India.....	24,707	14,853	21,093
Great Britain.....	143,148	62,870	117,899
France.....	69,184	2,722	3,728
United States.....	137,228	148,554	75,362
Other countries.....	12,191	22,211	19,229

—Chem. and Drug., 91 (1919), 364. (K. S. B.)

Menthol.—*Optical Activity when Dissolved in Eugenol and Phenol.*—Mixtures of menthol, eugenol, and phenol are used as local

anesthetics, particularly in dentistry, and a solution of menthol (40 per cent.), phenol (40 per cent.), and eugenol (20 per cent.), is described in the latest edition of the Swedish Pharmacopœia under the name "tinctura antidontalgica." For the estimation of the menthol content, O. Von Friedrichs has determined the specific rotation, at 18°, of solutions of menthol in phenol ($p = 25-50$), in eugenol ($p = 10-50$), and in mixtures of phenol and eugenol (2:1, 1:1, and 1:2), and has derived formulæ by which the menthol content may be directly calculated from the optical activity. —Arch. Pharm.; through J. Soc. Chem. Ind., 38 (1919), 439A.

Menthol.—*Uses for.*—In the place of various sprays, Atkinson suggests that menthol crystals should be ground and kept in a tin box in the waistcoat pocket, so as to be ready for use when respiration becomes difficult and troublesome. All that is required is to wet the fore or little finger so as to get a small quantity of the menthol to adhere to it, and then rub the inside of the nostril as far only as the edge of the cartilage. After this a forced nasal expiration should be made. In inflamed sebaceous follicles, ground menthol should be rubbed in with a damp finger.—Brit. Med. J.; through Chem. and Drug., 91 (1919), 63.

Oil of Monarda Fistulosa.—*Constituents of.*—E. R. Miller distilled the oil from the 1915 crop of *Monarda fistulosa* and found it was pale yellow in color when obtained early in the season, the later distillate being deep red. The specific gravity of the oil at 25° was 0.928, or for the oil extracted from the aqueous distillate, 0.970. The phenol value of the oil was 58 per cent., and 98 per cent. for the oil extracted from the water. The oil distilled from 1916 material had a specific gravity 0.9253 and a phenol content of 57 per cent., while the oil obtained from the distillation waters had a specific gravity 0.972, refractive index 1.5045, and phenol value 96 per cent. An exhaustive chemical examination of the oil was carried out, and the following substances were isolated from it: Carvacrol, *d*- α -pinene, *l*- α -pinene, *p*-cymene, one or two terpenes not identified, butyric aldehyde, isovaleric aldehyde, piperonal (?), hydrothymoquinone, thymoquinone, dihydroxythymoquinone, dihydrocuminic alcohol, an alcohol not yet identified, acetic acid, butyric acid, valeric acid, caproic acid, and some basic substances. In the aqueous distillate were found acetone, formic aldehyde, methyl alcohol, formic acid, and acetic acid.—Circ. 4, Univ. Wis.; through Chem. and Drug., 91 (1919), 494.

Oil of *Monarda Punctata*.—Unusual Sample of.—Matured flower tops were collected in October. After about a month's storage they were threshed and the remaining chaff was steam distilled. The total yield amounted to 0.9 per cent., an unusually high percentage for material collected so late in the season. When assayed by Max Philips, this oil yielded 82 per cent. of phenol, which was much higher than the ordinary oil. The high density and high phenol content may have been due to the long time that elapsed between maturity of seeds and the time of distillation. The oil was then separated into phenols and non-phenols and the application of further tests served to identify hydrothymoquinone, which had not previously been found in *Monarda punctata*.—J. Am. Pharm. Assoc., 8 (1919), 175. (Z. M. C.)

Oil of *Mosla Grosserrata*.—Properties of.—Himeshiso is a wild annual Japanese herb (*Mosla grosserrata*) growing 1-2 feet high, with petiolate, ovate leaves and flowers in racemes. The fresh herb after blossoming gave by steam distillation 0.24 per cent. of essential oil having sp. gr. 0.9137 at 15°, acid value nil, and $[\alpha]_D = -3^\circ$. According to S. Furukawa, the oil contains 25 per cent. of carvacrol, together with 1 per cent. of thymoquinol, and 0.5 per cent. of thymoquinone and thymoquinhydrone. From the non-phenolic portion of the oil which had sp. gr. 0.8841, ester value 17.68, ditto after acetylation 51.2, about 40 per cent. of *p*-cymene was isolated, and the presence of phellandrene and terpinene was shown by qualitative tests.—J. Chem. Ind., Tokyo; through J. Soc. Chem. Ind., 38 (1919), 877A.

Oil of *Mosla Japonica*.—Properties of.—According to K. Hoshino, the principal constituent of the essential oil of this plant, called by the Japanese, "Yamashiso," is either thymol or carvacrol, but both have never been found together in the same oil. A sample of thymol-containing oil had the following characters: Sp. gr. 0.9154, $n_D^{20} = 1.4996$, $\alpha_D = 1.0^\circ$, ester value 4.5, thymol 50.06 per cent. It was almost insoluble in 70 per cent. alcohol, but soluble in 2 vols. of 80 per cent. alcohol. The non-phenolic portion of the oil was distilled over sodium and collected in six fractions with the object of identifying the terpenes. The presence of phellandrene, *p*-cymene, γ -terpinene, caryophyllene, cadinene, and probably sabinene, was established.—J. Chem. Ind. Tokyo; through J. Soc. Chem. Ind., 38 (1919), 877A.

Oil of *Mosla Punctata*.—*Properties of.*—Y. Murayama finds that the dried herb, *Mosla punctata*, yields about 1 per cent. of yellow oil of sweet odor. This oil has the density, 0.8966 at 19°; acid number, zero; saponification number, 16.3; saponification number after acetylation, 36.4; and $[\alpha]_D$, -9.064 . At 18 mm. pressure 500 grammes of oil yielded 5 fractions; 37 grammes between 89 and 100°; 80 grammes between 100 and 105°; 55 grammes between 105 and 110°; 27 grammes between 110 and 114°; and 97 grammes of residue. From the fractions between 100 and 114° was obtained alpha-thujon, $C_{10}H_{14}O$, having a density 0.9097 at 20°; $[\alpha]_D$ -3.94 at 14°; n_D , 1.50993, at 14°. The fraction distilling above 114°, contained a sesquiterpene, $C_{15}H_{24}$, boiling at 125 to 128° at 12 mm. pressure, having the density 0.9259 at 16°, $[\alpha]_D$, $+2.16$ at 16°; and n_D , 1.51615 at 16°.—J. Pharm. Soc. Japan; through Chem. Abstracts, 13 (1919), 2969.

Orange Oil.—*Paraguayan.*—E. Albes discusses the distillation of oil of petit grain, used for scenting toilet soaps, from the leaves of bitter orange or bigarrade (*Citrus bigaradia*). There are between 30 and 40 factories operating in Paraguay, employing rather primitive stills. From 500 to 600 pounds of leaves are required to produce a quart of the ordinary oil of petit grain. The cost of the leaves is not great and the profit is large. In 1913 the amount of oil exported was 71,322 pounds.—Sci. Am. Supp., 88 (1919), 382. (Bot. Abstracts.)

Orange Oil.—*Process for Increasing Yield of.*—A. A. Kopf makes suggestions for increasing the amount of orange oil from local fruit. He thinks that by the present method of grating against needles only about 30 per cent. of the oil is obtained, and proposes the following procedure: From the fruit the thick layer of yellow skin containing the oil should be removed by a hand or foot power orange peeler (obtainable at a very reasonable price). The skin can be automatically fed into a form of meal grinder which will make it into a pulp similar to ordinary sawdust. From this grinder it is automatically passed into a fruit press and subjected to pressure sufficient to squeeze out about 60 per cent. of the contained oil.—Pharm. Era, 52 (1919), 286.

Oil of Peppermint.—*Chinese.*—Y. Shimosaki finds that Chinese peppermint oil is of a light brown color and has a rather disagree-

able odor and a bitter taste. It has the following characters: Sp. gr. at 25° 0.9091, $n_{25}^{25} = 1.4627$, $[\alpha]$ (in chloroform) = -35° , saponification value 29, ditto after acetylation 233, free menthol 70.57 per cent. combined menthol 8.08 per cent., ketones (as menthone) 12.88 per cent.—J. Chem. Ind., Tokyo; through J. Soc. Chem. Ind., 38 (1919), 877A.

Oil of Peppermint.—*Japanese.*—Y. Shimosaki recommends for the menthol assay of this oil, called in Japan, "Torioroshi," the acetylation ester value method. Mineral oil and some vegetable seed oils were frequently used as an adulterant. These adulterants can easily be detected by the solubility of oil in 65 per cent. alcohol. For the detection of mineral oil in the crude distillate the solubility test in nitric acid (1.485–1.5) at 15° is more convenient and accurate. Fatty oil mixed in the peppermint oil is made apparent by the formation of grease spots when spread upon paper. The author examined the character of the crude distillate and the dementholized oil of commerce and obtained the following results:

	Crude distillate pale yellowish brown.		Dementholized oil. Yellowish brown.	
Color	4.5–4.4		5.0–4.5	
soly. in 65% alc. 5°.	All sol.*		All sol.	
Soly. in HNO ₃ .				
d_{25}^{25}	0.9011	— 0.8997	0.8991	— 0.8998
n_D^{25}	1.4595	— 1.4590	1.4614	— 1.4588
α_D^{25}	-37.18°	— -37.48°	-29.12	— -27.9°
Acid value.....	2.1	— 1.1	.....	— .....
Ester value.....	18	— 17	31	— 34
Sapon value.....	232	— 243	191	— 187

—J. Chem. Ind., Tokyo; through Chem. Abstracts, 13 (1919), 1896.

Oil of Peppermint.—*Japanese Exports.*—The Japanese exports of oil of peppermint for the past three years were as follows: 1916, 360,740 kin; 1917, 259,720 kin; 1918, 214,635 kin.—Chem. and Drug., 91 (1919), 364. (K. S. B.)

Oil of Peppermint.—*Unusual Sample of.*—A plant growing in central and northern France yields about 0.1 per cent. of oil, which resembles peppermint oil in taste and odor; it has specific gravity at 15° 0.920 and $[\alpha]_D = +8^\circ$. According to F. Elze, the oil con-

tains 40 per cent. of total alcohols, is poor in menthol and rich in pulegone. The plant, which is used medicinally by the inhabitants, appears to be a cross between *Mentha piperita* and *M. pulegium*.—Chem. Ztg.; through J. Soc. Chem. Ind., 38 (1919), 963A.

Oil of Peppermint.—*U. S. P. Assay for.*—A. B. Lyons believes that the method of determining esters is good. Though the ester is not all menthyl acetate, the discrepancy is negligible. Saponification increases the weight of the oil by 26 per cent. of the weight of menthyl acetate present. In its calculation of menthol, the U. S. P. introduces the factor 0.021 and applies it to the whole of the menthol (each mil of standard alkali corresponds to 0.07808 Gm. of menthol or 0.09909 of menthyl acetate making a difference of 0.021). The formula for percentage of menthol is

$$\frac{A \times 7.808}{B - (A \times 0.021)}$$
 A representing the number of mils of standard alkali consumed in neutralizing the acid of acetylation, including that of the ester originally present and B representing the weight of acetylated oil taken. To find the true per cent. it is necessary to deduct from $(A \times 0.021)$ a compensating correction which will vary with the total menthol content. For an oil containing about 50 per cent. of menthol the following empirical formula may be used.

$$\text{Percentage of total menthol} = \frac{A \times 7.808}{B - (A - C \div 2.5) \times 0.021}$$

The general formulas which Mr. Lyon gives is simpler (P standing for per cent. of menthol present as ester):

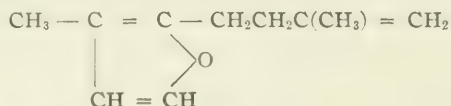
$$\text{Percentage of total menthol} = \frac{A \times 7.808}{B - (A \times 0.021)} \times \frac{100 - (P \times 0.212)}{100}$$

—J. Am. Pharm. Assoc., 8 (1919), 10. (Z. M. C.)

Oil of Perilla Arguta.—*Composition and Properties.*—Gattefossé finds that *Perilla arguta* gives 0.045 per cent. of a red-brown volatile oil, the leaves alone giving a distinctly higher yield. The odor is somewhat nauseous, but when diluted with alcohol the oil has a pleasant hay-like perfume. It has specific gravity 0.9320 at 25°, and $\alpha_D = 93^\circ$. On saponification an odor of geraniol is

produced, and 55 per cent. of aldehydes is indicated by the sulphite method, consisting mainly of dihydrocuminic aldehyde. The oil gives a naphthyl-urethane, melting point 146° , identical with that from the alcohol of gingergrass oil.—Perf. Essent. Oil Rec.; through J. Soc. Chem. Ind., 38 (1919), 553A.

Oil of Perilla Citriodora.—*Composition and Properties.*—Kondo and Yamaguchi find that the dry leaf of *Perilla citriodora* yields 2 to 3 per cent. of a volatile oil, having the density 0.911 to 0.913, and containing 59.26 per cent. of citral. In addition to citral, the oil contains a liquid, *perillen*, boiling at 185 to 186° , having a density of 0.9017 at 20° and an index of refraction $n_D = 1.47053$ at 20° . It is optically inactive. They find its formula is $C_{10}H_{14}O$, hence isomeric with carvone and myrrol, but differing from each of these in physical and chemical properties. They believe its structural formula is



—J. Pharm. Soc. Japan; through Chem. Abstracts, 13 (1919), 1617.

Pinene.—*Synthesis of Active.*—E. V. Lynn summarizes his work as follows:

1. The variation in yield of pinene nitrochloride with the optical rotation of the pinene was thought due to the formation of optically active pinene nitrochloride.

2. Wallach's method for preparing this compound was modified by eliminating acetic acid and using alcoholic hydrogen chloride.

3. Optically active pinene nitrochloride was isolated and converted to active benzylamine and piperidine bases to active pinene.

4. The gas given off during the preparation of pinene nitrochloride is nitrogen in amount equal to half of that added.

5. The mother liquor was briefly examined and nitric acid, ammonium chloride, a substance reducible to a base and a basic substance boiling as 22° have been isolated.—J. Am. Chem. Soc., 41 (1919), 361. (J. L. M.)

Pine Needle Oil.—*Constitution of Swedish.*—T. Ekcrantz pressed out 1 kilo of the oil from the needles of *Pinus silvestris*,

and saponified it by boiling for one hour with twice its volume of N/2 alcoholic potash. Acetic acid was the only acid detected by isolation of the silver salt. The mixture of terpenes and terpene alcohols produced by saponification was fractionated; the fraction 200–212° on purification yielded an alcohol of melting point 203°, identified as *l*-borneol. No other terpene alcohol could be isolated from the fractions 190–200° and 212–225°. Thus the ester present in the oil is *l*-bornyl acetate, which is also present in the oil from *Abies pectinata*.—Medd. Kgl. Vetenskaps. akad. Nobelinst.; through J. Soc. Chem. Ind., 38 (1919), 844A.

Pine Resin.—*Sesquiterpene from.*—O. Aschan reported that a distillate obtained in the large scale distillation of pine resin contained a new sesquiterpene, probably a bicyclic sesquiterpene allied to cadinene, giving a dihydrochloride, $C_{15}H_{26}Cl_2$, melting point 85–86°, in the form of glittering rhombic leaflets readily soluble in organic solvents.—Finska Kem. Meddel.; through J. Soc. Chem. Ind., 38 (1919), 656A.

Oil of *Pinus Thunbergii*.—*Properties of.*—Turpentine from the Japanese pine, *Pinus thunbergii*, locally known as *kuromatsu* or *o-matsu*, according to Y. Shinosaki, consists of 22.92 per cent. of essential oil and 73.36 per cent. of colophony, with 3.61 per cent. of moisture and 0.21 per cent. impurities. The essential oil, which was separated by distillation with steam, had the following characters: Specific gravity at 15°/4° 0.8740; $n_D^{20} = 1.4738$; $\alpha_D = -19.17$; and acid value 0.53. It was soluble in 8 volumes of 90 per cent. alcohol and 28 volumes of 80 per cent. alcohol. About 80 per cent. of the oil distilled between 154° and 169°, and about 4 per cent. between 169° and 252°. The fraction (15 per cent.) distilling above 252° had specific gravity 0.9244, $n_D^{20} = 1.4993$; and $\alpha_D = +36.25$. By fractional distillation *in vacuo* three main fractions were obtained, *viz.*, (1) about 73 per cent. of the original oil consisting of α -pinene; (2) a fraction containing camphene; and (3) a liquid tricyclic sesquiterpene boiling at 105–106° (2 mm.), and having specific gravity 0.9370 at 15°; $n_D^{20} = 1.5055$; and $\alpha_D = +43.5^\circ$.—J. Chem. Ind., Tokyo; through J. Soc. Chem. Ind., 38 (1919), 21A.

The α -pinene contained in the oil of *Pinus thunbergii* consists chiefly of the levo-compound, together with a small amount of the

inactive isomeride. The dihydrosesquiterpene, formed by hydrogenation of the tricyclic hydrocarbon of the oil, had the following characters: Boiling point 98–99° at 2.3 mm.; specific gravity at 15° 0.9294; $n_{20} = 1.4959$, mol. refraction 64.34 (calc. for $C_{15}H_{24}$ 64.24).—J. Chem. Ind., Tokyo; through J. Soc. Chem. Ind., 38 (1919), 877A.

Sandalwood Oil.—*East Indian Production.*—During the year ended June 30, 1918, the Bangalore and Mysore factories handled 1,222 tons of sandalwood, from which was manufactured 114,965 lbs. of oil.—Chem. and Drug., 91 (1919), 392. (K. S. B.)

Sandalwood Oil.—*West Australian.*—The Western Australian sandalwood tree (*Fusanus spicatus*) yields a sandalwood oil which is practically identical, chemically and pharmacologically, with that obtained from other sources of supply. The santalol content of the oil varies from 75 to 80 per cent., but the oil has not been officially recognized by the British and American pharmacopœias because there has hitherto been present in it a certain small per cent. of sesquiterpene ethyl. This oil has been used in hospitals in Australia and there is evidence that the sesquiterpene ethyl is as actively curative as the santalol in the oil. A recently discovered process eliminates this ingredient entirely, so the oil may now be obtained up to the requirement.—Bull. Imp. Inst.; through Pharm. Era, 52 (1918), 313.

Sandalwood Oil.—*West Indian.*—The Austrian Minister of Public Health has issued a warning against the use of "West Indian sandalwood oil," which is obtained from *Amyris balsamifera* (Rutaceæ), and is stated to give rise to dangerous secondary effects, owing to the presence of irritant terpenes.—Chem. and Drug., 91 (1919), 533. (K. S. B.)

Thymol.—*Assay of.*—Moles and Marquina proceeds as follows: A solution of thymol in water is added to sodium bicarbonate solution. A measured quantity of standard iodine is added in excess. After addition of sulphuric, or preferably, hydrochloric acid, the excess of iodine is titrated with thiosulphate solution. With varying values of the ratios thymol: bicarbonate, and thymol: thymol iodine added, the mean quantity of iodine consumed per

molecule of thymol was found to be 3.60 atoms.—Anal. Fis. Quim.; through J. Soc. Chem. Ind., 38 (1919), 388A.

Dihydroxy-Thymoquinone.—*Reduction by Means of Palladium-Hydrogen.*—Nellie A. Wakeman calls attention to the fact that thymoquinone and its oxidation and reduction products form an interesting series of compounds which have, from time to time, received considerable attention at the hands of organic chemists. Miss Wakeman's interest in these compounds was aroused by the seemingly important role which they appear to play in the pigmentation of several species of *Monarda*, and it has been held no less by the behavior of the substances themselves than by their biochemical significance.

Palladium was employed as a catalyst in the hydrogenation of organic compounds of Paal and Skita to reduce quinone to hydroquinone. The question of the action of thymoquinone towards this reagent, therefore naturally presented itself and accordingly the action was tried in alcoholic action. Thymoquinone reduced very readily upon evaporation of the solvent, it yielded hydrothymoquinone, which was identified by its melting point, its solubility and its crystalline form.—J. Am. Chem. Soc., 41 (1919), 1873. (J. L. M.)

Finnish Turpentine.—*Derivatives from.*—A. Aschan reports on his researches as follows: An unsaturated, unfreezable terpene alcohol, $C_{10}H_{17}OH$, was isolated together with a sesquiterpene from the fractions from Finnish turpentine from various sources boiling at 210–220° and 260°. The terpene alcohol was not identical with ordinary terpineol and is perhaps a mixture of terpineol with other terpene alcohols. The sesquiterpene, $C_{15}H_{24}$, has boiling point 260–263° at 760 mm., specific gravity at 20°/4° 0.9187, and is unsaturated towards permanganate, bromine and hydrochloric acid. On treatment with dry hydrogen chloride it is converted into cadinenol dihydrochloride, melting point 117–118° from which cadinenol, boiling point 271° can be isolated.

A new bicyclic, saturated terpene hydrocarbon, boiling point 163–165°, specific gravity at 20°/4° 0.8628, $[\alpha]_D = +7.7^\circ$, closely related to pinene, can be obtained from Finnish turpentine by distilling with steam. It gives pinene nitrosochloride on treatment with amyl nitrite and hydrochloric acid.

By stirring turpentine rapidly for 10 hours at 1° with 45 per cent. sulphuric acid 53.2 per cent. of the theoretical yield of terpin was obtained, the *trans*-terpin of Bayer being obtained as a by-product. Nopinene from American turpentine also yielded terpin when acted on by 45 per cent. sulphuric acid at a low temperature. Terpin can be obtained by the action of 55 per cent. sulphuric acid at -6° on dipentene, *trans*-terpine being also obtained as a by-product. The conversion of terpin hydrate into terpineol by the abstraction of water is best brought about by the action of 0.5 per cent. oxalic acid solution, while formic acid is the most suitable for the conversion of pinene into terpineol. Five parts of 40 per cent. sulphuric acid stirred for 5 hours with 1 part of terpineol with ice-cooling gives an almost quantitative yield of terpin hydrate. The fraction from Finnish turpentine distilling at $155-167^{\circ}$ containing the pinene-like terpin also gives a good yield of terpin hydrate. Terpene alcohol and cadinene were recognized in a sample of Finnish turpentine and in a product obtained by distilling resin from *Pinus sylvestris* in the fraction boiling at $125-130^{\circ}$ at 9 mm., although it is possible that cadinene might have been formed from another sesquiterpene during the process of separation.—Finsk. Kem. Meddel.; through J. Soc. Chem. Ind., 38 (1919), 656A.

Oil of Turpentine.—*Pyrogenic Decomposition of.*—Sabatier, Mailhe and Gaudion report that when oil of turpentine is passed over finely divided copper heated to 550° aromatic hydrocarbons are produced, the yield in some cases being 21 per cent. When the vapors of oil of turpentine are passed over finely divided nickel or iron energetic decomposition of the oil results with much charring.—Compt. rend.; through J. pharm. chim., 20 (1919), 133.

Oil of Turpentine.—*Halogen Absorption of.*—By treating turpentine with a large excess of IBr_3 in chloroform and titrating back at once, Ethel M. Taylor found that a distinct resting stage at a halogen absorption equal to 4Br for $\text{C}_{10}\text{H}_{16}$ is given. The secondary reactions increasing the absorption are sufficiently slow not to interfere with the main rapid reaction.—Chem. and Drug., 91 (1919), 1316. (K. S. B.)

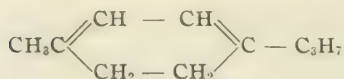
Terebene.—*Standard for.*—Because of the varying optical rotation and specific gravity of different samples of turpentine

now encountered commercially, and the resultant variations of these constants in terebene made from such turpentine, Bernard F. Howard recommends that specific gravity and optical rotation be disregarded as tests for pure terebene, substituting the requirement that the boiling point be limited to mainly between 165° and 185° , with not over 5 per cent. distilling below 160° .—Chem. and Drug., 91 (1919), 807. (K. S. B.)

Terpenes.—*Simple Rotatory Dispersion in.*—Lowry and Abram dispersive power of complicated organic compounds for four wavelengths, forty compounds being investigated, and found that the dispersion ratio of the F line is constant for all homologous bodies, from which it may be deduced that if the rotatory power is a function of wave-length, it is constant for that series; and the question arose: What was the nature of this function? Seven attempts had been made to discover the relation between rotation and wave-length, and all the known relationships in each series had been explored. The linear relation is not constant in all derivatives, although camphor, carvone, menthol, myrrhenol, and pulegone exhibit linear relationships. The tartrates do not comply with the above-mentioned formula, which shows that they occupy a separate place; they give a more complex rotation than such complex bodies as camphor and its derivatives, etc., with two or three asymmetric carbon atoms, the presence of which makes for rotatory complexity.—Chem. and Drug., 91 (1919), 297.

Terpene Ozonides and Peroxides.—*Use as Therapeutic Agents.*—The old idea that only the oxygenated constituents of volatile oils were therapeutically active has given way before the recognition of the value of products of oxidation of the terpenes either by oxygen or ozone. Three things, E. V. Lynn tells us, must be kept in mind in any investigation: careful differentiation between ozonides and peroxides; lack of simplicity in the addition reactions; lack of stability of the addition products, the therapeutic value being largely due to this. A thorough study of the entire field is badly needed.—J. Am. Pharm. Assoc., 8 (1919), 103. (Z. M. C.)

Terpinene.—*Presence in Oil of Eucalyptus Megacarpa.*—After a study of this oil, H. G. Smith concludes that its terpinene has the graphic formula:



—J. Roy. Soc. N. S. Wales; through Chem. Abstracts, 13 (1919), 1741.

Terpineol.—*Reaction with Hypochlorous Acid.*—Slawinski finds that when an acetic acid solution of terpineol with 1 per cent. sodium hypochlorite solution, two isomers are obtained, both chlorohydrine of 1,2,8-methanetriol. One melts at 114–115°, boils at 162–165°, and yields on treatment with 20 per cent. potassium hydroxide pinol hydrate. The other melts at 60–80° and boils at 125–155° and on treatment with 20 per cent. potassium hydroxide yields a mixture of pinol and pinol hydrate.—Chemik. Polski; through Chem. Abstracts, 13 (1919), 887.

ALCOHOLS AND DERIVATIVES.

Acetaldehyde.—*Synthesis from Acetylene.*—T. Shoji finds a 2 per cent. solution of mercuric oxide in 25 per cent. sulphuric acid the best absorbent of acetylene, the yield of acetaldehyde being 80–84 per cent. The solution should be warmed at first, but subsequently no external heating is necessary.—J. Chem. Ind., Tokyo; through J. Soc. Chem. Ind., 38 (1919), 303A.

Acetone.—*Enzyme Production of.*—At a conference on fermentation industries held in London, F. Nathan describes the large scale development of the Weizmann process for producing acetone by the bacterial fermentation of corn, rice, horse chestnuts, etc. At the Toronto plant an output of 200 long tons per month was eventually reached.—J. Soc. Chem. Ind., 38 (1919), 271T.

At the same conference, Amos Gill describes the reactions in the above process, and in the discussion that followed, Professor Fernbach claimed priority over Weizmann, pointing out that the Synthetic Products Co. had been producing acetone by his method since 1917.—J. Soc. Chem. Ind., 38 (1919), 273T.

Acetone.—*Micro-Assay of.*—M. Ljungdahl discusses in detail the conditions which must be observed in the iodometric titrations employed in his micro-method for the estimation of acetone in order

to ensure accuracy.—*Biochem. Zsch.*; through *J. Soc. Ind.*, 38 (1919), 924A.

Acetone and Butyl Alcohol.—*Enzyme Production of.*—H. B. Speakman discusses the production of acetone and butyl alcohol in considerable quantities from corn meal by action of Weizmann's organism. The article describes the process in detail.—*J. Soc. Chem. Ind.*, 38 (1919), 155T.

Acetone, Ethyl Alcohol, and Benzene.—*Estimation in Air.*—A paper by S. Elliot and J. Dalton gives their method of estimating small quantities of acetone, alcohol and benzene in air. A measured quantity of the air is drawn through suitable apparatus, the vapors being absorbed simultaneously as follows: The acetone in alkaline iodine solution, and the excess of iodine titrated with thiosulphate; the alcohol in dilute chromic acid, and after oxidation to acetic acid, the excess of chromic acid is titrated with iodine; the benzene in a mixture of concentrated sulphuric acid and fuming nitric acid, converted into dinitrobenzene, and after extraction with ether, reduced by a known excess of stannous chloride and the excess of the latter titrated with iodine.—*Chem. and Drug.*, 91 (1919), 256. (K. S. B.)

Acetone and Ethyl Alcohol.—*Production by Fermentation.*—Owing to the great demand for acetone created by the war, the following direct fermentation process was worked out by the authors, John H. Northrop, Lauren H. Ashe, and R. R. Morgan.

A dilute solution of beet molasses was inoculated with a culture of *Bacillus acetoethylicum*, and after fermentation was complete, the fermented mash was distilled, giving a yield of 8 to 8.5 per cent. of the sugar as acetone and 20 to 21 per cent. as alcohol.

An apparatus is described for conducting continuous fermentation and to prevent contamination of mash with other microorganisms.—*J. Ind. Eng. Chem.*, 11 (1919), 723. (L. A. B.)

Acetone, Methyl Alcohol and Furfural.—*Assay of Mixtures of.*—Pringsheim and Kuhn dilute a quantity of the mixture of acetone, methyl alcohol, and furfural (*e. g.*, wood spirit prepared by boiling sawdust with dilute acid under pressure) containing from 0.1 to 0.34 gramme of furfural to 200 mls and treated with 10 mls of phenylhydrazine solution (phenylhydrazine 7.5, sodium acetate

10 grammes, per 100 mils of water); after 2 hours the precipitate is collected, dried *in vacuo* over sulphuric acid, and weighed. The weight of the precipitate is multiplied by 0.516 to obtain the quantity of furfural present. The filtrate from the hydrazone is rendered strongly acid with hydrochloric acid, and distilled, the distillate treated with an excess of magnesia, and again distilled until one-third of the volume of the liquid has passed over; this distillate contains the methyl alcohol and acetone. An aliquot portion of the distillate (not more than 25 mils and containing not more than 0.1 gramme of methyl alcohol) is placed in a flask 50 mils of dichromate solution (potassium dichromate 45.968 grammes, sulphuric acid 50 mils per litre; 1 mil of this solution = 0.005 gramme methyl alcohol) and 50 mils of sulphuric acid (1:1) are added, the flask is closed by a stopper fitted with a water-trap, and the mixture is kept at ordinary temperature for 18 hours; the excess of dichromate is then titrated with ferrous ammonium sulphate solution. Under these conditions the acetone is not oxidized. The acetone is determined iodometrically in a separate portion of the distillate.—Z. angew. Chem.; through J. Soc. Chem. Ind., 38 (1919), 877A.

Alcohol.—*Assay in Fermented Liquors.*—Charles H. Rogers in a paper read before the Northwestern Branch of the American Pharmaceutical Association makes comparisons of the results of alcohol determinations by the following four methods: (a) Taking gravity of fluid, evaporating the alcohol, making up to original volume with water and again taking gravity of de-alcoholized fluid. (b) By distilling and taking gravity of distillate. (c) By refractometer (d) Vaporimeter (Geissler). Tables are offered showing the results of numerous determinations.—J. Am. Pharm. Assoc., 8 (1919), 547. (H. H. S.)

Nag and Lal assay alcoholic liquors by "salting out" ethyl hydrate with potassium carbonate, their claim being that the separated liquid is alcohol hydrate, $4C_2H_5OH.H_2O$. The manipulation is to treat a known weighed quantity of the alcoholic liquor placed in a tube graduated to tenths of a mil with an excess of anhydrous potassium carbonate, adding 5 to 10 per cent. of water if the alcohol content is 90 per cent. or higher. The alcohol layer is read off and the percentage is calculated by use of the following formula:

$(V + v \times 0.00275)[1 - 0.001068(t - 15.6)] \times 0.7936 \times 94.06 \div W$ = percentage of alcohol.

V = volume of alcohol layer in mls; v = volume of the saturated potassium carbonate solution, in mls; 0.00275 = solubility of the alcohol in the potassium carbonate solution; 0.001068 = coefficient of expansion of the alcohol hydrate layer; 0.7936 = density of absolute alcohol at 15.6° C.; 94.06 = percentage of alcohol in the alcohol hydrate layer; W = weight of the alcohol liquor taken. The various coefficients given in the foregoing formula were worked out in the experiments of the authors.—J. Soc. Chem. Ind.; through Am. J. Pharm., 91 (1919), 115.

W. G. Toplis discusses the foregoing paper and shows that not only alcohol, but also substances soluble in dilute alcohol and insoluble in concentrated alcohol or a saturated solution of a salt may be thus assayed. When essence of pepsin is saturated with dried potassium citrate, the alcohol rises to the top, pepsin forms a middle layer and solution of potassium citrate is at the bottom. A graduated tube shows approximately correct proportions. Several other applications of practical value to pharmacists are cited—J. Am. Pharm. Assoc., 8 (1919), 803. (Z. M. C.)

Alcohol.—*Assay of Ether in.*—H. E. Cox finds that alcohol of 99 per cent. and upwards, distils over unchanged under ordinary conditions; any ether present passes over in the first fractions, and no constant boiling mixture is formed. It is, therefore, possible to determine the amount of ether by taking the specific gravity before and after distillation. The specific gravity of the alcohol is assumed to be that found after the removal of the ether. Each 1 per cent. of ether lowers the specific gravity of alcohol by 0.0007 and the quantity of ether present is indicated by the expression

$$\frac{\text{sp. gr. of alcohol} - \text{sp. gr. of mixture}}{0.0007}$$
 Tables are given showing the effect of ether on the specific gravity of alcohol.—Analyst; through J. Soc. Chem. Ind., 38 (1919), 117A.

Alcohol.—*Denaturing for Chemical Laboratories.*—A revised official United States formula permits the denaturing of alcohol by the addition of 10 parts of pure methyl alcohol of a specific gravity of not more than 0.810 at 60° F. to each 100 parts of pure 95 per cent. of ethyl alcohol, when the product is to be used ex-

clusively as a reagent for analytical purposes by chemical and physical laboratories.—Chem. and Drug., 91 (1919), 360. (K. S. B.)

Alcohol.—*Detection of Methyl Alcohol in.*—M. Polinski adds to 5 mls of the sample, 50 mls of water and transfers the mixture to a flask containing 3 grammes of sodium persulphate, $\text{Na}_2\text{S}_2\text{O}_8$, and then distils, collecting fractions of 2 mls each. To the fifth fraction he applies the phenylhydrazine-ferrocyanide reaction for formaldehyde.—Chem. Analyst; through Chem. Abstracts, 13 (1919), 3113.

W. Zimmermann finds that in tests for methyl alcohol in ethyl alcohol, spirits, etc., which depend on the oxidation of the methyl alcohol to formaldehyde by means of permanganate and the detection of the aldehyde by magenta-sulphurous acid reagent, the latter should be at least 24 hours old; freshly prepared reagent gives a coloration in the absence of methyl alcohol. The presence of acetaldehyde in the sample does not interfere with the test, as it is destroyed during oxidation. A coloration which develops after 5 minutes should be ignored. Methyl alcohol may also be detected by dissolving 0.5 gramme of sodium salicylate in 1 gramme of the alcohol to be tested and adding 5 drops of concentrated sulphuric acid during one minute; a distinct odor of methyl salicylate is noticed if methyl alcohol is present.—Pharm. Zent.; through Pharm. Era, 52 (1919), 313.

J. W. Ehman, finding the U. S. P. test for methyl alcohol in ethyl alcohol unsatisfactory in numerous experiments because of faulty technique, suggests the following manner of carrying out the U. S. P. test to insure accurate results. Place 5 mls of the alcohol to be tested, which has previously been diluted to 10 per cent., in a test-tube. In another test-tube place 5 mls of a pure 10 per cent. ethyl alcohol. Bring temperature of both tubes to 25° . Add the reagents specified to both tubes at the same time so as to retain uniformity and after each addition of sulphuric acid cool the tubes to 25° , keeping them at this temperature throughout the test. If the blank gives bright red color at once, which does not fade in ten minutes, repeat the test with both and vary the temperature. If the blank is violet after 10 minutes, too high a temperature is indicated; if a bright red color persists, too low a temperature. In the absence of methyl alcohol no pink or violet color appears

within half an hour under artificial (yellow) light, not a pale greenish, blue or violet in one hour by daylight, the solution being pale yellow or colorless. When much methyl alcohol is present, the solution will become violet at once, changing to purplish red.—Proc. Penna. Pharm. Assoc., 42 (1919), 238. (R. P. F.)

Salkowski dilutes the suspected alcohol with 9 times its volume of water and to 0.5 mil of the liquid, three mils of dilute sulphuric acid and three mils of a one per cent. potassium permanganate solution are added. The mixture is allowed to stand for eight minutes, is then decolorized with a saturated solution of oxalic acid and distilled. To the distillate 0.08 gramme of peptone, three drops of a three per cent. ferric chloride solution and its own volume of hydrochloric acid are added and the mixture is boiled, when in the presence of as little as one per cent. of methyl alcohol a bright violet color develops. This test, which depends on the formation of formaldehyde from the methyl alcohol, is liable to give misleading results when the ethyl alcohol contains higher alcohols such as propyl, isobutyl or isoamyl alcohols, which on oxidation yield traces of formaldehyde. Since, however, in the wilful adulteration of alcohol with methyl alcohol quantities smaller than 10 per cent. of the latter are generally not used, and the strong coloration given by this percentage of methyl alcohol is very distinct from the slight coloration produced by the small quantities of higher alcohols which might be present in the ethyl alcohol.—Z. Unter. Nahr. Genussm.; through Drug. Circ., 63 (1919), 382.

Alcohol.—*Investigation of Value as Motor Fuel.*—Two automobile associations have undertaken to jointly finance research work at Manchester University under the direction of Harold B. Dixon to determine the behavior of alcohol vapor and the vapors of alcohol-benzol mixtures after firing, with the object of ascertaining the conditions of combustion and the factors which conduce to maximum power and efficiency from existing internal combustion engines when run on alcohol and alcohol mixtures.—Chem. and Drug., 91 (1919), 290. (K. S. B.)

Alcohol.—*Oxidation with Potassium Permanganate.*—William L. Evans and Jesse E. Day summarize the results of their researches on the oxidation of ethyl alcohol by means of potassium permanganate as follows:

1. In neutral aqueous solutions of potassium permanganate, at temperatures of 25, 50, 75 and 100° that sole reaction product of the oxidation of ethyl alcohol is acetic acid.

2. (a) When ethyl alcohol is oxidized at the temperature of 25, 50 and 75° by means of alkaline potassium permanganate solution containing 5.32 to 340.8 grammes potassium hydroxide per liter, the reaction products are acetic, oxalic and carbonic acids; when ethyl alcohol is oxidized at 100° by means of potassium permanganate in the presence of 0.415 gramme potassium hydroxide per liter of solution, the product is still acetic, but when the alkalinity was from 0.461 to 340.8 grammes per liter oxalic acid and carbonic acid were present in addition to the acetic acid.—J. Am. Chem. Soc., 41 (1919), 1267. (J. L. M.)

Alcohol.—*Production from Peat.*—E. W. Thompson says methods for extracting alcohol from peat have been attended with such marked success that the Swedish government has agreed to the building of a factory. Shareholders in the company will have the right to purchase and use the alcohol for their motor boats, trucks and private automobiles irrespective of government prohibitions and maximum prices.—Nat. Drug., 49 (1919), 248. (C. M. S.)

Alcohol.—*Production from Swedish White Moss.*—Albert Halstead says the County Syndicate Aktiebolag has asked the Swedish government for permission to make 5,000,000 liters of alcoholic spirit from white moss. The alcohol is of good quality and can be more cheaply made than from either grain or potatoes.—Nat. Drug., 49 (1919), 18. (C. M. S.)

Alcohol-Ether-Water Mixtures.—*Reciprocal Solubility of.*—Boutin and Sanfourche determined the solubility relations between water, alcohol, and ether, by measuring the quantity of one constituent which it was necessary to add to different mixtures of the other two of known composition until two layers were just formed or just disappeared. If the results are plotted on a triangular diagram, a curve is obtained dividing the triangular area into two zones, the one representing homogeneous and the other heterogeneous mixtures. From the curve it is easy to calculate the quantity of any constituent which it is necessary to add to any mixture to pass from a homogeneous to a heterogeneous mixture or *vice versa*. No homogeneous mixture can be made heterogene-

ous by addition of alcohol alone. The composition of various mixtures at the critical point or limit of heterogeneity at 15° is given in the following table:

Water. %	Alcohol. %	Ether. %
93.0	0.0	7.0
87.6	4.9	7.4
82.5	9.7	7.7
77.1	14.9	8.0
69.7	20.3	10.0
61.3	23.9	13.8
55.7	26.1	18.3
49.1	27.4	23.5
39.9	28.2	35.9
29.5	27.8	42.9
23.0	27.0	50.0
18.0	24.9	57.0
10.7	19.4	69.9
6.8	14.7	78.5
4.4	9.9	85.7
2.5	5.0	92.4
1.1	0.0	98.9

—Bull. Soc. Chim.; through J. Soc. Chem. Ind., 38 (1919), 793A.

Alcohol-Water Mixtures.—*Shrinkage of.* Finding it necessary to know the volume percentage of alcohol resulting from the dilution of any given strength of alcohol with water, H. C. Wood, Jr., conducted some experiments, upon which he reports. To alcohol (93 per cent. by volume) contained in a burette graduated in tenths, measured volumes of water were added. The burette was stoppered and reversed several times, given time to return to normal temperature and the volume read. In general, the shrinkage was greatest at a little over 50 per cent., amounting to about 2.9 per cent.

When mixtures of absolute alcohol are used, the shrinkage can be figured from the alcoholometric tables in the U. S. P. Multiply the number of volumes of alcohol to be used by 0.79365 (specific gravity of absolute alcohol) which gives its weight; add the number of volumes of water and divide this sum into the weight of alcohol used, which gives percentage by weight. Compare the weight per cent. found with the U. S. P. tables to find the equivalent volume per

cent. Divide the original volume of alcohol by the volume per cent. thus found and subtract the result from 100. The result will be the percentage of shrinkage.

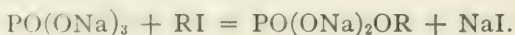
With absolute alcohol the greatest shrinkage, 3.612 per cent., is with 54 volumes of alcohol and 46 of water. Dr. Wood gives several tables showing his results and has also constructed a curve showing the theoretical shrinkage and the average obtained by actual experiment.—J. Am. Pharm. Assoc., 8 (1919), 730. (Z. M. C.)

Alcohols.—*Characterization as Allophanates.*—A. Béhael states that alcohols, primary, secondary and tertiary, can be isolated and studied, as allophanates, the procedure being to pass through the alcohol cyanic acid gas produced from cyanic acid. After precipitation of the allophanate it is washed with ether and recrystallized from some anhydrous product, such as absolute alcohol, benzene or acetone, after which its melting point can be taken.—Compt. rend.; through J. pharm. chim., 20 (1919), 133.

Alkyl Chlorides.—*Catalytic Formation of.*—Sabatier and Mailhe report that when the vapors of primary aliphatic alcohols are passed along with hydrogen chloride over aluminium oxide heated to 420° a mixture of the corresponding primary, secondary, and tertiary alkyl chlorides is obtained together with some ethylenic hydrocarbon. The secondary or tertiary chlorides usually predominate.—Compt. rend.; through J. Soc. Chem. Ind., 38 (1919), 695A.

Alkyl Iodides.—*Action of Acetylene-Sodium on.*—Picon has found that the action of acetylene-sodium on alkyl iodides differs according as to whether the chain branches at the carbon atom bearing the halogen or not. In the first case, the halogen gives place to the group $\text{C}=\text{CH}_2$, whereas when the chain does not branch at that point, the group $\text{C}\equiv\text{CH}$ becomes attached.—Compt. rend.; through J. pharm. chim., 20 (1919), 102.

Alkyl Iodides.—*Reaction with Sodium Phosphate.*—O. Bailly finds that the alcoholic iodides react on neutral sodium phosphate in aqueous solution, giving, in the case of the first members of the series only, considerable proportions of the corresponding phosphoric mono ether—



The iodides of methyl, ethyl, allyl, propyl, isopropyl, and isobutyl were used, and deminormal aqueous solutions of trisodium phosphate. The temperature at which the reaction was carried out was 60° in the case of the iodides of methyl and allyl and 100° with the other iodides. The monoether was extracted, after elimination of the unattacked phosphate, in the form of the calcium salt which is very soluble even in the cold. A number of new alkyl phosphates of the alkalis and alkaline earths have thus been prepared. Besides the monoether there is always a small quantity of monophosphoric diether formed:



The compounds obtained are really the phosphoric monoethers (alkylphosphates) and not the tautomeric bodies (alkylphosphinates) in which the alcoholic residue would be directly united with the phosphorus. The compounds are hydrolyzable with regeneration of phosphoric acid. Generally speaking the solubility of the alkyl phosphates, derived from the monovalent alcohols, of the alkaline earth metals is greatest in the case of the barium salt, less for the strontium, and least for the calcium salt.—*Compt. rend.*; through *Chem. News*, 118 (1919), 191.

Alkyl Alcohol.—*Assay of.*—M. J. Stritar reports that bromine is quantitatively absorbed by allyl alcohol; the reaction is suitable for the estimation of allyl alcohol, which may be effected either by direct titration with bromine water until a permanent yellow coloration is observed, or by treating the acidified aqueous solution of the alcohol with an excess of bromide-bromate solution, followed by addition of potassium iodide and titration of the liberated iodine with thiosulphate.—*Monatsh. Chem.*; through *J. Soc. Chem. Ind.*, 38 (1919), 199A.

Bromoform Water.—E. Crouzel recommends the use of a saturated aqueous solution of bromoform in place of the glycerol-alcoholic solution of the French Codex. Bromoform water should be kept in completely filled well-stoppered bottles.—*Rep. pharm.*; through *Chem. Abstracts*, 13 (1919), 2727.

Carbon Tetrachloride, Chloroform and Carbon Hexachloride.—*Preparation from Natural Gas.*—Jones and Allison describe the chlorination of natural gas, on a small scale. By using certain

catalyzers, such as war-gas charcoal or steamed anthracite coal, and using four or more parts of chlorine to one of gas, the reaction took place smoothly without explosions or deposition of carbon.

The apparatus used consists of flow meters to regulate the flow of gases, a reaction chamber heated by means of an electric furnace, a thermocouple, scrubbers, ice bath, drying tower, etc. The temperature range extends from about 225° to 500°.

By adjusting the flow of gas, complete chlorination can be obtained in one operation, the methane going completely to carbon tetrachloride and the ethane to carbon hexachloride. When using larger ratio of gas, both chloroform and carbon tetrachloride are produced.—J. Ind. Eng. Chem., 11 (1919), 639. (L. A. B.)

Chloral Hydrate.—*Assay in Complex Mixtures.*—Compressed tablets containing chloral hydrate, potassium bromide, cannabis extract, hyoscyamus extract, zinc bromide, starch, talcum and adhesive may be assayed for chloral hydrate by the following method worked out by George Êwe: Place sample equivalent to 1.5 grammes of chloral hydrate in an 8-ounce centrifuge bottle. Add exactly 100 mls of ether. Shake four hours and let stand over night. Shake thoroughly, centrifuge and place in a 50-mil aliquot in a separator containing exactly 30 mls of half-normal potassium hydroxide. Shake three minutes. Draw off alkaline layer into an Erlenmeyer flask. Wash the separator and ether with three 25-mil portions of water shaking one minute each time and allowing washings to run into the Erlenmeyer flask containing bulk of standard alkali. Add phenolphthalein test solution to the flask containing the standard alkali and titrate with N/2 sulphuric acid. One mil N/2 KOH equals 0.0827 gramme of chloral hydrate (crystallized).—Proc. Penna. Pharm. Assoc., 42 (1919), 178. (R. P. F.)

Chloretone.—*Properties of.*—H. C. Hamilton describes the chemical properties and the results of physiological studies of this compound by American and European workers. Data in regard to its use as a local anesthetic, comparing it with cocaine, and its application as a hypnotic and sedative, are considered. Its insecticidal and germicidal action are also considered, and tabulations submitted of its germicidal action on varieties of organisms. An exhaustive bibliography also accompanies the article.—Am. J. Pharm., 91 (1919), 643. (I. G.)

Chloretone Water.—*Use as Preservative of Biological Specimens.*—O. H. Farwell points out that chloretone is soluble in water to the extent of 0.5 to 0.8 per cent.; that a saturated aqueous solution of chloretone costs \$1.00 to \$1.50 per gallon; and that the solution is an excellent preservative for biological specimens. As examples of this, he cites his experiences in preserving algæ, water lily stems and purslane, as well as various insects.—J. Am. Pharm. Assoc., 8 (1919), 1053.

Chloroform.—*Detection of Hydrochloric Acid in.*—In chloroform treated with a minute quantity of para-dimethylaminoazobenzene a violet color is produced when free hydrochloric acid is present; otherwise the solution remains yellow, according to Vorländer. An excess of the reagent, which imparts to chloroform a yellow color, should be avoided, as otherwise a feeble violet coloration produced by traces of hydrochloric acid might be masked. Carbon dioxide, formic acid and acetic acid do not give a violet coloration with the reagent.—Ber. dtsch. pharm. Ges.; through Drug. Circ., 63 (1919), 146.

Chloroform.—*Electrolytic Preparation of.*—J. Feyer criticizes the usual electrolytic methods of making chloroform and states that by using a neutralization cathode, i. e., a second cathode in a porous cell through which is passed a current of sufficient strength to keep the electrolyte approximately neutral, it is possible to obtain a current yield of 65 per cent. When platinum electrodes are used a yield of 75 to 80 per cent. of the theoretical quantity of chloroform (calculated from the quantity of acetone) is obtained with a current density of 1.1 amp. per sq. cm. at the anode and 0.5 amp. per sq. cm. at the cathode. The primary reaction in the electrolysis is the formation of hypochlorite, which is followed by the reaction $\text{CH}_3\text{COCH}_3 + 3\text{HOCl} = \text{CHCl}_3 + \text{CH}_3\text{COOH} + 2\text{H}_2\text{O}$. Methyl ethyl ketone and higher ketones react in the same way with electrolytic hypochlorite. Feyer criticizes the Trechzinsky process of making chloroform from alcohol and suggests improvements.—Z. Elektrochem.; through J. Soc. Chem. Ind., 38 (1919), 599A.

Chloroform.—*Preparation of Anesthetic.*—L. M. Van den Berg suggests the following method for preparing chloroform for narcosis. Commercial chloroform is shaken twice with an equal volume of water and then once with an equal volume of a mixture of

equal parts of baryta water and water. It is then dried in an amber bottle by shaking with calcium chloride for at least twelve hours and distilled in a dark room, the first and last sixths of the distillate being collected separately. These may be used for external purposes. To the main distillate the necessary quantity of absolute alcohol is added. Chloroform residues are shaken first with sulphuric acid before the treatment described above. The chloroform thus obtained answers the requirements of the pharmacopœia in every respect.—Pharm. Weekblad, 56 (1919), 226. (H. E.)

Carbon Oxychloride.—*Assay of.*—A saturated aqueous solution of aniline is the most sensitive reagent for phosgene, with which it forms diphenylurea and aniline hydrochloride, according to the equation



Kling and Schmutz found that the reaction takes place at once, even in the cold. The diphenylurea, which separates in the form of long needles and melts at 236° , is almost insoluble in water and can therefore easily be estimated, and from the amount found the phosgene can be calculated.—J. pharm. chim.; through Drug. Circ., 63 (1919) 551.

Chloropicrin.—*Use as Insecticide.*—G. Bertrand finds that in an atmosphere containing only 1 to 2 centigrammes of chloropicrin, caterpillars are killed within 10 minutes and plant lice within an hour or so.—Compt. rend.; through J. pharm. chim., 19(1919), 457.

In the course of experiments with chloropicrin as an insecticide, Roux found that in a room of 75 cubic meters, containing eight beds, the application of 750 grammes of the gas killed all insects in four hours.—Chem. and Drug., 91 (1919), 989. (K. S. B.)

Dichloro-Ether.—*Preparation of.*—E. A. Wildman and Harold Gray call attention to the fact that an investigation which was recently carried out involved the use of 1,2-dichloro-ether, a substance which is not available on the market. An examination of the literature showed that the best method of preparation was probably by direct chlorination of ether, a method used by Fritsche and Shumacker, although they did not give sufficient details to

carry out the operation successfully. The present workers give a detailed method of preparation.—J. Am. Chem. Soc., 41 (1919), 1122. (J. L. M.)

Ether.—*Catalytic Preparation of.*—Mailhe and De Godon use as catalyst aluminium oxide prepared by heating ordinary commercial alum to 190–195°. Using a suitable amount of such a catalyst, disposed in four tubes, the temperature of the catalyst being maintained at 190° to 195°, a yield of ether equivalent to 71.3 per cent. of the theory was obtained from 95 per cent. alcohol passing at the rate of 25 mils per hour. The yield depends upon the weight of catalyst rather than upon the surface exposed, and also upon the strength of the alcohol used. The product obtained is pure, the catalyst can be regenerated, if necessary, by simple solution, evaporation, and calcination, and the whole of the alcohol can ultimately be converted into ether, by repeating the process after concentrating the unchanged alcohol.—Bull. soc. chim.; through J. Soc. Chem. Ind., 38 (1919), 962A.

Ether.—*Detecting Impurities in.*—F. Weehuizen examined an ether which gave with benzidine and hydrogen dioxide solution a blue color and very probably contained dioxides which, as has been reported before, render ether rather dangerous because of liability of explosions when the ether is rectified. Such an ether can be easily deprived from the substance that colors benzidine by shaking with a few pieces of potassium hydroxide. It seems that the presence of water in ether produces substances which give the above reaction, because it is always positive when ether is shaken with water and allowed to stand in diffused light for a few days.—Pharm. Weekblad, 56 (1919), 303. (H. E.)

Ether.—*Spontaneous Combustion in Air Mixtures.*—E. Alilaire finds that if air and ether are mixed, they will react with ignition when heated to 190°. The reaction will occur even when the proportion of ether to air is only 1 gramme to the liter.—Compt. rend.; through J. pharm. chim., 19 (1919), 441 and 457.

Purified Ether.—*Variation in Commercial Samples.*—At the 1919 meeting of the British Pharmaceutical Conference, A. J. Jones pointed out the confusion existing in England between "ether" and "purified ether," emphasizing that the latter is the

only one to be used for anesthesia. He discusses the requirements of the British Pharmacopœia for purified ether, with special emphasis upon tests for methyl compounds and for acetone.—*Chem. and Drug.*, 91 (1919), 809.

Ethyl Acetate.—*Use in Opium Assays.*—O. Von Friedrichs discusses the use of this solvent in place of ether in the determination of morphine in opium by the methods of the German, Swedish, Belgian and other pharmacopœias. As a rule it gives slightly lower values, which may be attributed to hydrolysis of the ethyl acetate by the excess of ammonia, especially when the solution is left for a long time in contact with the ethyl acetate, as in the method of the Swedish Pharmacopœia. Under these conditions the liberated acetic acid is shared between the ammonia and the alkaloid, and a certain proportion of the crystallized morphine is dissolved again. Impure ethyl acetate containing methyl formate and amyl acetate gave very low results in the method. Under ordinary conditions the difference between the results obtained with ether and with pure ethyl acetate in the determination of morphine in a sample of opium was less than 0.1 per cent.—*Pharm. Zent.*; through *J. Soc. Chem. Ind.*, 38 (1919), 197A.

Formaldehyde.—*Assay of.*—Blank and Finkenheimer mix 3 grammes of formaldehyde solution with 25 mils of double-normal sodium hydroxide V. S., then add slowly 50 mils of 3 per cent. hydrogen dioxide solution previously made neutral to litmus. After 2 or 3 minutes titrate excess of alkali with double-normal sulphuric acid V. S., using litmus as indicator.—*Pharm. Ztg.*; through *Chem. Abstracts*, 13 (1919), 1290.

Formaldehyde.—*Cause of Skin Trouble.*—At a recent trial the prisoner was found to be suffering from a skin disease said to be due to formalin, he having contracted the inflammation while acting as assistant demonstrator in anatomy at the London Hospital. The disease caused his fingers to swell to nearly double their size, and ultimately seemed to affect his general health.—*Chem. and Drug.*, 91 (1919), 380. (K. S. B.)

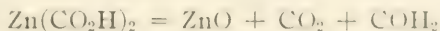
Formaldehyde.—*Disinfection with.*—E. Arnould summarizes the various proposed methods of formaldehyde disinfection without special apparatus, including the quicklime, the bleaching powder and the permanganate methods. He mentions as proprietary

forms of such disinfection, *antan*, paraformaldehyde and barium dioxide; *aldogan*, paraformaldehyde and bleaching powder; *paragan* and *perantan*, paraformaldehyde and permanganate; *festiform* and *autoform*, paraformaldehyde and soda soap.—Rev. Hygiene et police sanitaire; through J. pharm. chim., 19 (1919), 402.

Formaldehyde.—*Disinfection of Seed with.*—C. C. Thomas places the seed on trays in a steamer, and a current of steam carrying with it atomized formaldehyde solution is passed in. The most efficient disinfection results from two hours' exposure to this formalin steam vapor with a dose of formalin solution of 1 pint to every 1000 cubic feet. The treatment kills bacteria and mould spores, and does not affect the vitality of the seeds treated in any way.—J. Agric. Res.; through Pharm. J., 103 (1919), 203.

Formaldehyde.—*Explosive Derivative of.*—A. Moersch on treating commercial solution of formaldehyde with hydrogen chloride obtained $\text{CH}_2(\text{OH})\text{Cl}$ and then $(\text{CH}_2\text{Cl})_2\text{O}$. The latter heavy liquid on treatment with a mixture of nitric and sulphuric acids yielded a colorless oil, $\text{C}_2\text{H}_4\text{O}_6\text{N}_2$, having the density 1.52206 at 4° and presumably the structural formula $\text{NO}_2\text{—CH}_2\text{—OCH}_2\text{NO}_2$. This compound is very explosive and produces with nitrocellulose a jelly that is as explosive as are the cellulose-nitroglycerin jellies.—Atti Acad. Lincei; through J. pharm. chim., 20 (1919), 352.

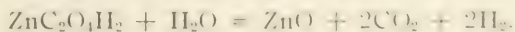
Formaldehyde.—*Production from Formates.*—K. A. Hofmann and Helge Schibsted found that formaldehyde can be prepared from formic acid (which is obtained by conducting water-gas over soda lime) by converting the acid into the zinc salt and decomposing this by heating at 250° . The reaction takes place according to the equation



together with a secondary reaction,



The methyl formate is easily split up into formaldehyde and methyl alcohol. Water vapors should be avoided in the reaction since otherwise the zinc formate is split up into zinc oxide, carbonic acid gas and hydrogen according to the equation



The process can also be carried out by conducting anhydrous formic acid vapors over asbestos impregnated with a mixture of zinc oxide and zinc dust.—Ber.; through Pharm. Weekblad, 56 (1919), 406. (H. E.)

Supplementing this, it is reported all metallic formates react similarly. The temperature at which a distinct and sustained evolution of gas from the formate begins is in general higher the more strongly basic is the metallic oxide. For the following formates the temperatures are: Copper, 170°; lead, 195–200°; nickel, 210°; zinc, 240–245°; iron, 245–250°; manganese, 295–300°; barium, 325°; calcium, 335°; magnesium, 340–345°; strontium, 355°; lithium, 355°; sodium, 355°; potassium, 375°. By this process considerable formaldehyde and methyl alcohol are produced if the catalyst and the temperature of reaction are so selected that the formation of a formate is rendered possible. Zinc oxide and thoria are the best catalysts for this purpose.—Ber.; through Pharm. Era, 52 (1919), 71.

Formaldehyde.—*Polymerization by Alkalies.*—It has already been shown that when alkalies act on formaldehyde either formic acid and methyl alcohol are formed, or else aldol condensation, resulting in the formation of "formoses," ensues. C. Mannich has found that another reaction may occur, namely, the formation of a polymer of formaldehyde, which separates as a white crystalline mass when moderately concentrated alkalies act at the ordinary temperature on 30 per cent. formaldehyde solution. The analysis and the properties of the substance show that it is a polymeric formaldehyde. Auerbach and Barschall have already pointed out that when concentrated sulphuric acid acts on formaldehyde solutions four different polyoxymethylenes are obtained. The α and β modifications are soluble in sodium sulphite, while the γ and δ forms are insoluble. The α and β modifications are distinguished by their crystalline form and by their behavior when boiled with water; only the α form is readily soluble in water. The polymerization product obtained by the author so closely resembles α -polyoxymethylene that there can be no doubt that it is identical with it.—Ber.; through Chem. News, 118 (1919), 239.

Formaldehyde Tablets. During the 1918 influenza epidemic a variety of tablets or lozenges were advertised which were claimed

to owe their asserted value to the fact that they contained formaldehyde and liberated it on contact with the saliva. Tablets containing hexamethylenamine or other formaldehyde compounds can neither cure respiratory infection nor even confer a protection against such infection. To be effective, formaldehyde would need to be supplied to the entire respiratory tract continuously for some time, or else in concentrations that would be distinctly irritant and damaging to the tissues.—J. Am. Med. Assoc., 73 (1919), 1077. (W. A. P.)

Glycerin.—*Detection of Arsenic in.*—W. Zimmermann finds that while arsenic-free glycerin mixed with starch paste and iodine gives a blue color, when the sample contains arsenic a reduction sets in decolorizing the mixture. He finds the best proportions for the test are 3 mls of the glycerin, 1 mil of starch paste and 0.1 mil of tenth-normal iodine V. S.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2731.

Glycerin.—*Production by Fermentation.*—K. Schweizer gives details of method of production of glycerin by the alcoholic fermentation of sugar. The author states that the addition of a reducing agent to the fermenting liquid will result in the yield of a larger amount of glycerin. This is in accordance with the statement of Oppenheimer, that the glycerin is formed by the reduction of glyceraldehyde or dihydro-oxyacetone, into which the hexoses are primarily broken up. The author found that acid-oxidizing agents were of no value, but that the addition of sodium sulphite augmented the yield of glycerin materially. Schweizer, with yeast and sodium sulphite, obtained from each 100 grammes of sugar, 21.3 grammes of glycerin.—Schweiz. Chem. Ztg.; through J. Ind. Eng. Chem., 11 (1919), 1064. (G. C. D.)

A. R. Ling notes that the Germans in the summer of 1917 were producing glycerin in large quantities by a fermentation process. Chemists from the laboratory of the Internal Revenue Bureau were able to solve the same problem insofar that glycerin could be produced at a fair rate of cost. The best yields of glycerin according to the report, were obtained by fermenting solutions of sugar, containing 5 per cent. of sodium carbonate, added in small portions. The yield of glycerin from molasses ranges from about 3 to 5 per cent. The value of this process is probably more notable in times

of war than in normal times.—*Am. J. Pharm.*, 91 (1919), 622. (I. G.)

Eoff, Lindner and Beyer give details of the process outlined above by Ling. The necessary conditions are:

An alkaline reaction, a sugar concentration of 17.5 to 20 grammes per 100 mils and the choice of the proper variety of yeast. Of a great many yeasts tried, *Saccharomyces ellipsoideus* (Var. Sternberg) was found to yield the greatest amount of glycerin.

After the fermentation was complete, the glycerin was recovered from the fermented mash by neutralizing with sulphuric acid, adding crude ferrous sulphate and heating almost to boiling point and adding milk of lime in slight excess, boiled and then filter-pressed.

The filtrate was then evaporated to thick syrup in a vacuum evaporator and then distilled.

It is stated that the value of the alcohol produced during the fermentation is sufficient to pay the cost of all materials and overhead charges entering into the production of the fermented mash, so that the cost of the glycerin would be that of purification and distillation.—*J. Ind. Eng. Chem.*, 11 (1919), 842. (L. A. B.)

Connstein and Lüdecke obtained 20 grammes of glycerin from 100 grammes of sugar by allowing the yeast to act in the presence of potassium sulphite. A solution of one kilo of sugar and 400 grammes of sodium sulphite in 10 liters of water to which ammonium sulphate, sodium phosphate and potassium salts are added, is completely fermented by 100 grammes of yeast in a few days. The yeast, which has changed its morphological character but not its fermentative power, is filtered off, from the filtrate, the alcohol and aldehyde are removed by distillation, and in the aqueous liquid the salts are precipitated successively by calcium chloride and sodium carbonate. The mixture is then filtered, neutralized with hydrochloric acid and filtered again. The filtrate is concentrated and distilled. In addition to 20 per cent. of glycerin, 27 per cent. of alcohol and 3 per cent. of aldehyde are obtained. Neither the race of yeast, nor the nature of the sugar nor the temperature during the fermentation process influence the yield of glycerin. Raw sugar and even molasses can be used.—*J. Soc. Chem. Ind.*; through *Drug. Circ.*, 63 (1919), 551.

Glycerin.—*Recovery by British Army.* The glycerin recovered by saving fat and bones in the British Army was sufficient to make

25,000,000 18 pr. shells during 1916, 1917 and 1918.—Chem. and Drug., 91 (1919), 266. (K. S. B.)

Glycerin.—*Substitute for.*—A German patent states that the soluble magnesia salts of butyric acid form good substitutes for glycerin on account of their high viscosity, neutral reaction, and low freezing point, their suitability being further improved by a slight addition of alcohol or glycerin; for example, a 30 per cent. aqueous solution of magnesium butyrate with 5 per cent. alcohol remains homogeneous at -20° and exhibits no tendency to crystallize. For many purposes a 23 per cent. solution of the butyrate is sufficient. The preparation is not corrosive, dissolves to a clear solution in water, has a high solvent action on many substances, and is miscible with glycerin and other substitutes.—Oil, Color Trade J.; through J. Ind. Eng. Chem., 11 (1919), 1064.

Glycerin.—*Use in U. S. P. and N. F. Preparations.*—E. A. Ruddiman reports the results of some experiments carried out on twenty preparations, the object being to determine whether glycerin adds to their permanence or improves them in any other way. Five samples of each preparation were made according to formula; replacing glycerin by syrup; replacing it by water; replacing it by a commercial solution of invert sugar; and replacing it by glucose having a specific gravity of about 1.21. The tabulation of results shows the color and appearance (precipitate) at the end of six months and at the end of one year. Dr. Ruddiman found that invert sugar has a tendency to postpone precipitation for a time but at the end of a year the amount of precipitate was about the same as in those made with glycerin. Glycerin is not necessary for the permanence of these preparations and sometimes large amounts are objectionable but it is preferable when a considerable amount of acid or inorganic salt is present because sugar is easily caramelized.—J. Am. Pharm. Assoc., 8 (1919), 818. (Z. M. C.)

Glycol Monochlorhydrin.—*Distillation of Aqueous Solutions of.*—Bancelin and Rivat find that commercial aqueous solutions of glycol monochlorhydrin give, on distillation, a constant boiling mixture (97.85° at 760 mm.) containing 42 per cent. of the monochlorhydrin, this result being independent of the concentration of the original solutions. These results were confirmed by distillations of solutions prepared with the pure monochlorhydrin, except

that the amount then found in the distillate was 41 per cent.—Bull. soc. chim.; through J. Soc. Chem. Ind., 38 (1919), 962A.

Iodoform.—*Action of Reducing Agents on.*—A. Gutmann finds that iodoform oxidizes alkali arsenites, antimonites, stannites, and sulphides. With an alkaline solution of sodium arsenite, for example, it reacts almost quantitatively according to the equation $\text{CHI}_3 + \text{Na}_3\text{AsO}_3 + \text{NaOH} = \text{CH}_2\text{I}_2 + \text{NaI} + \text{Na}_3\text{AsO}_4$.—Ber.; through J. Soc. Chem. Ind., 38 (1919), 477A.

Iodoform.—*Solubility in Glycerin.*—P. Chiaria determined the solubility of recrystallized iodoform in 95 per cent. double distilled glycerin (density, 1.255 at 15°) and found that at 15° 0.123 per cent. was dissolved. Solubility was not greatly increased by increased temperature or by use of anhydrous glycerin.—Giorn. farm. chim.; through Chem. Abstracts, 13 (1919), 55.

Methyl Alcohol.—*Detection of.*—The liquid under examination is distilled and oxidized with potassium permanganate solution in the usual way and to the filtrate two drops of ferrous sulphate solution and a few crystals of pyrocatechol or guaiacol are added. On underlaying this mixture with concentrated sulphuric acid a reddish violet ring is formed when methyl alcohol is present in the liquid. G. Maue claims that by using pyrocatechol one part of methyl alcohol in 40,000 parts and by using guaiacol one part in 100,000 parts can be detected.—Z. Unter. Nahr.-Genussm.; through Pharm. Weekblad, 56 (1919), 308. (H. E.)

Methyl Alcohol.—*Distinguishing from Absolute Alcohol.*—T. Sabalitschka suggests the following method: The sample (2 mls) is frequently shaken during ten minutes with powdered crystalline copper sulphate (0.1 gramme) and the solution is filtered. The filtrate is treated with water (5 mls) and ammonia solution (10 per cent., 3 mls); with methyl alcohol, a deep blue to blue coloration is developed while with ethyl alcohol the solution is only colored a faint, pale blue. The method may also be used to obtain an approximate estimation of methyl alcohol in mixtures of the latter with absolute alcohol providing the content is not less than 20 per cent.; if this is the case, 20 mls of the specimen are distilled and the test is performed on the first 2 mls of the distillate, but the results are only reliable when affirmative. In the presence of water, even

in small quantities, the process is useless since the solutions of hydrated salts in alcohol are unstable and the presence of water promotes separation of the salt. Instead of copper sulphate, crystalline ferrous sulphate may be used. The test is performed in a similar manner but, owing to the greater instability of the solutions, agitation should be restricted to five minutes. The presence of iron in the filtrate is detected by addition of water (5 mls) and 2.5 per cent. potassium ferricyanide solution (2 mls), the colorations obtained varying from dark blue with pure methyl alcohol to pale green with ethyl alcohol.—Ber. dtsch. pharm. Ges.; through J. Soc. Chem. Ind., 38 (1919), 388A.

Methyl Sulphate.—*Preparation.*—Haworth and Irvine have patented a process where methyl sulphate is made by passing absolutely dry sulphuric anhydride and methyl ether (free from both water and alcohol) into an appropriate solvent, preferably methyl sulphate itself. During the passage of the gases, the solvent must be agitated and must be kept cool. After the reaction, the excess of sulphuric anhydride is removed by reduction and the product rectified.—J. Chem. Soc. Abs., 116, I (1919), 147.

Propyl Alcohol.—*Use in Pharmaceuticals.*—Propyl alcohol has been suggested recently as a substitute for ethyl alcohol in perfumes and cosmetics. Heffter and Juckenack find that it possesses similar but more concentrated pharmacological properties, and is a stronger local stimulant than ethyl alcohol. Its albumin-precipitating effect is greater than that of ethyl alcohol. Little is known of the effect of propyl alcohol on the human body, but a warning is uttered against its use in foods and drugs for internal use.—Viertelj. gericht. Med. Sanitätsw.; through J. Soc. Chem. Ind., 38 (1919), 924A.

AROMATIC DERIVATIVES.

Acetphenetidine.—*Assay of Derivatives of.*—A. D. Powell says that the assay of substituted phenetidine compounds used in medicine, either alone or in admixture with other substances such as salol and caffeine, has always presented certain difficulties. He found that it was entirely practicable to assay this group of compounds by the use of oxidizing agents. Oxidation by means of potassium dichromate to form quinone was first used by him; but

finding this unsatisfactory the reaction between sodium hypochlorite and an acid solution of *p*-aminophenol was then hit upon and found to be very promising. He gives in detail the various methods evolved to determine mixtures of these substances.—The Analyst; through Am. J. Pharm., 91 (1919), 241. (J. K. T.)

Acetphenetidine. *Manufacture of.* W. A. Konantz presents a new method for the manufacture of acetphenetidine. He reviews the work done by earlier investigators and discusses briefly the disadvantages of their methods. Paranitrophenol being the initial intermediate in the processes of Hinsberg, Platt, Täuber and Paul, Mr. Konantz gives the history of the preparation of it together with the results of his own experiments conducted with the idea of verifying or disproving the findings of workers on it. In a similar manner, each of the other intermediates, *p*-nitrophenetol, *p*-aminophenetol and acetyl-*p*-aminophenol, is considered historically and then details of his own experiments explained. From them he concludes that the high cost of production eliminates the Riedel and Täuber methods. Finally, he gives a plan based on Hinsberg's method but with important improvements. Starting with the chlorination of benzene, he obtains *o*- and *p*-dichlorobenzene and mono-chlorobenzene. Nitrating the latter, he obtains *o*-chlor-nitrobenzene and *p*-chlor-nitrobenzene and from the latter he prepares successively *p*-nitrophenol, *p*-nitrophenetol, *p*-amidophenetol and finally *p*-acetphenetidine.

Careful directions are given for the preparation of each intermediate beginning with chlorobenzene and finally ending with a working formula for acetphenetidine itself. Mr. Konantz found that it could be produced "at a very low cost as compared with the older methods. The materials required are cheap and easily accessible; the operations involved are simple; and the yields at each step are good."—J. Am. Pharm. Assoc., 8 (1919), 284. (Z. M. C.)

Aromatic Arsenic Compounds.—Walter A. Jacobs and Michael Heidelberger submit a plan of procedure for the synthesis of arsenicals for chemotherapeutic research. This is followed by a series of papers in which records of hundreds of experiments are published. Among the topics discussed are: (a) The amides and alkyl, (b) the ureides and beta substituted ureides, (c) the aromatic amides of ~~arylglycin~~ ~~arylglycin~~ arsenic acids; substituted glycylarsenic acid; ~~o~~-phenylglycine and its amides; substituted benzyl-, phenoxethyl-

and phenacyl arsenilic acids; and the amides of arsonic acid. For details, the original papers should be consulted.—J. Am. Chem. Soc., 41 (1919), 1581, 1587, 1600, 1610, 1809, 1822, 1826 and 1831.—(J. L. M.)

In another paper, Jacobs and Heidelberger call attention to the fact that the present study of the action of arsenic upon phenol has demonstrated that this reaction is more complicated than has been heretofore assumed. They show that not only is *p*-hydroxyphenyl-arsenic acid formed in the reaction but several other related substances as well.—J. Am. Chem. Soc., 41 (1919), 1440. (J. L. M.)

Conant calls attention to the fact that the aromatic arsenic acids are becoming more important every day; many of them having been found to be useful drugs. Their preparation is a necessary step in the synthesis of many other aromatic arsenic compounds which have the most valuable therapeutic properties, for example, the widely used arsphenamine ("salvarsan"). The reactions by which the arylarsenic acids may be prepared are thus of considerable practical interest.

The reaction between phenol and arsenic acid has been studied and the optimum condition for the production of *p*-hydroxyphenyl arsenic acid determined. A yield of 20 per cent. can be obtained.—J. Am. Chem. Soc., 41 (1919), 431. (J. L. M.)

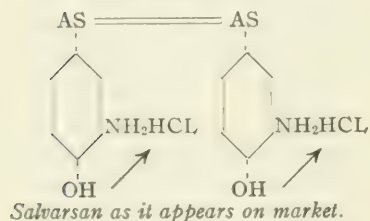
Arsenobenzenes.—*Chemico-therapeutics of.*—Giesma reports on hexa-aminoarsenobenzene, an easily soluble derivative, hexa-aminoarsenobenzenesulphaminic acid, $(\text{NH}_2)_3\text{C}_6\text{H}_2.\text{As}:\text{As}.\text{C}_6\text{H}_2.(\text{NH}_2)_2\text{NHSO}_3\text{H}$, "ethylarsalyte," $\text{NH}_2\text{CH}_2(\text{NH}_2)_2\text{C}_6\text{H}_2.\text{As}:\text{As}.\text{C}_6\text{H}_2.(\text{NH}_2)_2\text{NHCH}_2\text{H}_5$, and its dichloro substitution product. Certain members of these classes of substances have in addition to notable therapeutic properties the advantage of giving solutions which can be kept without change for a long period, when enclosed in ampuls in an atmosphere of an indifferent gas, or, with the addition of a reducing agent (sulphite), even when exposed to the air.—Dtsch. med. Wschr.; through J. Soc. Chem. Ind., 38 (1919), 598A.

Arsenobenzol.—*Decomposition of Solutions of.*—J. B. Rieger says that American arsenobenzol may contain an arseniuretted methyl compound, which decomposes with liberation of cacodyl like substance. Some preparations give a garlic like odor when dissolved, others develop it after standing in solution for some time. Ac-

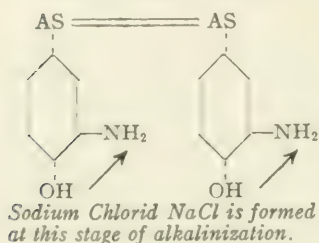
cording to the amount of this that may have accumulated, along with other factors, a reaction may occur after injection, marked by fall in blood pressure, dyspnea, and cyanosis. The author suggests that the use of methyl alcohol in its preparation should be avoided.—J. Lab. Clin. Med.; through Pract. Drug., Dec., 1919, 37.

Arsphenamine.—*Administration of.*—C. N. Myers gives the proper methods for preparing and injecting salvarsan. He believes that the pharmacist should be ready to prepare the salvarsan solution for the physician's use. The following shows the transformation of salvarsan into the disodium salt used for intravenous injection.

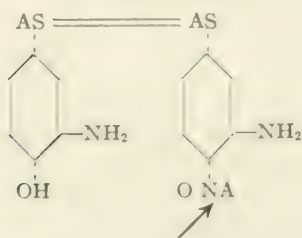
I. SALVARSAN



II. SALVARSAN BASE



III. MONO-SODIUM SALT OF SALVARSAN



I.

SALVARSAN DI-HYDROCHLORIDE.

Yellow powder about 31.50% arsenic.
Soluble in cold water.
Acid to litmus.
Solution *not* suitable for intravenous administration.

II.

SALVARSAN BASE.

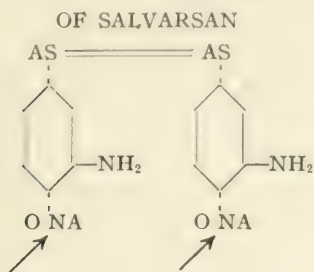
Precipitated upon addition of 12 drops of 15% sodium hydroxide solution or 2.52 cc. of normal sodium hydroxide solution per 0.6 gram salvarsan.
Insoluble yellow precipitate.
Causes reactions.
Not suitable for intravenous administration.

III.

MONO-SODIUM SALT OF SALVARSAN.

Formed upon addition of 18 drops of 15% sodium hydroxide solution or 3.78 cc. normal sodium hydroxide solution.
Just soluble in water.
Clear yellow solution.
Slightly alkaline to litmus.
Not suitable for intravenous administration.

IV. DI-SODIUM SALT



IV.

DI-SODIUM SALT OF SALVARSAN.

Formed upon addition of 24 drops of 15% sodium hydroxide solution or 5.04 cc. normal sodium hydroxide solution.

Completely soluble in water.

Clear yellow solution.

Ready for intravenous administration in dilution of 0.1 gram in 30 cc. of freshly distilled water.

This is the *only* form in which salvarsan solution should be used.

—Pract. Drug., Sept., 1919, 30. (H. H. S.)

The U. S. Public Health Service has issued a circular concerning the dilution and the rate of administration of arspenamine solutions. A study as to the cause of the disagreeable results following the use of the various preparations of arspenamine has indicated that most disagreeable results are not inherent in the preparations but are produced through faulty steps in the administration of the remedy, chiefly from the use of too highly concentrated solutions and by too rapid administration.—J. Am. Med. Assoc., 72 (1919), 1372. (W. A. P.)

Arsphenamine.—*After-Effects of Use of.*—Since the introduction of salvarsan took place, death appears to have been hastened in only 0.016 per cent. of the 75,000 cases investigated. Blindness followed its use in 0.0013 per cent. of administrations, and deafness in 0.0026 per cent.—Chem. and Drug., 91 (1919), 330. (K. S. B.)

Arsphenamine.—*New Preparation of.*—Results of new researches in salvarsan, made at the Frankfurt Institute of Therapeutics, are reported by Kolle. Two new salvarsan preparations have been discovered, "Silver salvarsan," and a salvarsan that can be kept in solution.—Chem. and Drug., 91 (1919), 330. (K. S. B.)

Arsphenamine.—*Patent Literature of.*—H. T. Lewis reviews the patent literature of the aromatic arsenic compounds and outlines the evolution of this class of compounds, from atoxyl up to the present time.—J. Ind. Eng. Chem., 11 (1919), 141. (L. A. B.)

Arsphenamine and Neoarsphenamine.—*Manufacture of.*—H. A. Krumwiede gives the various steps in the so-called oxalic acid method

for making diamino-dioxy-arsenobenzene dihydrochloride, named arsphenamine by the Federal Trade Commission and sold under various names by various firms.

Neo-arsphenamine, the sodium salt of diamino-dioxy-arsenobenzene methanal sulphonylate, is prepared by treating arsphenamine in solution with formaldehyde sulphonylate to obtain the neo-base which in turn is dissolved in sodium carbonate solution.

Details of the various steps are given and finally chemical and physical properties. Attention is directed to the fact that one factor which has contributed to toxicity is eliminated when methyl alcohol and ether are not used to precipitate the dihydrochloride. The presence of some inorganic arsenic even when most carefully made, as well as various organic arsenic combinations having greater toxicity than arsphenamine, make imperative a determination biologically before the product is marketable. The Hygienic Laboratory of the U. S. Public Health Service requires 30 per cent. of arsenic and a maximum tolerated dose of 100 mg. per kilo-body-weight for arsphenamine; 19 per cent. arsenic in neo-arsphenamine and a dose of 200 mg. per kilo-body-weight.—J. Am. Pharm. Assoc., 8 (1919), 795. (Z. M. C.)

P. A. Kober calls attention to the fact that the synthesis of arsphenamine or salvarsan suitable for therapeutic purposes, in spite of the work of Ehrlich and Berthelm and their collaborators, is still a vital problem.

As a result of his researches he suggests a new method of preparation which is much less expensive and simpler than Ehrlich and Berthelm's method has been developed for the preparation of the dihydrochloride of arsphenamine base in pure aqueous solution by means of hydrochloric acid, the product being salted out similarly as in the preparation and purification of sodium chloride with hydrochloric acid.

The final product of the new method may have one or two molecules of water depending upon the drying. This seems to be the first time the dihydrochloride of the arsphenamine base has been prepared without organic or other solvents in combination or present in the final product.—J. Am. Chem. Soc., 41 (1919), 442. (J. L. M.)

Arsphenamine.—*Silver-Sodium Compound of.*—A. Binz discusses this compound and suggests the following assay: The compound is decomposed, in alkaline solution, by means of hydrogen dioxide.

The silver is precipitated as an oxide, and the arsenic in such form as makes its oxidation into arsenic acid readily accomplishable. The author states that after boiling the substance with hydrogen dioxide for one hour and adding nitric acid the liquid was evaporated to dryness. The residue was then boiled for one hour with an excess of sodium hypochlorite, under a reflux condenser. The excess of sodium hypochlorite was removed by boiling with hydrochloric acid, and the silver chloride removed by filtration. The quantity of arsenic in the filtrate was estimated with magnesia mixture. The author calls especial attention to the fact that this method for determining arsenic cannot be employed in the case of all organic arsenic combinations.—Chem. Zentr., 90 (1919), 37. (G. C. D.)

Arsphenamine.—*Toxicity of.*—Two deaths following injection of salvarsan are reported. It is suggested that hot weather may have caused chemical changes in the liquid.—Chem. and Drug., 91 (1919), 655. (K. S. B.)

Atoxyl.—*Stability of.*—G. Bertrand noticed that atoxyl when heated at 125° is decomposed with the formation of aniline and the poisonous sodium arsenate. He further reports on several samples of atoxyl which had been kept in the tropics for several years. No change in the physical appearance of the product could be noticed but on dissolving it in water (atoxyl is soluble in six parts of water) a milky solution, from which a white precipitate separated, was formed. The latter consisted of arsenous acid, while the solution contained sodium arsenate. Aniline was absent.—Rept. pharm.; through Pharm. Weekblad, 56 (1919), 981. (H. E.)

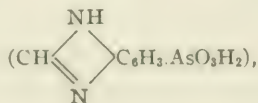
Atoxyl.—*Solutions Containing Mercuric Iodide.*—Labat recommends the following for intramuscular injection. A. Atoxyl, 10 grammes; mercuric iodide, 0.5 gramme; sodium iodide, 5 grammes; distilled water to make 100 mls. B. Atoxyl, 10 grammes; mercuric iodide, 0.2 gramme; sodium iodide, 2 grammes; distilled water to make 100 mls. The solutions are placed in yellow glass bottles and are then sterilized.—Boll. chim. farm.; through Chem. Abstracts, 13 (1919), 55.

Atophan.—*Physiological Action of.*—L. Rotter reports that the physiological action of atophan is due to an increased oxidation of the purine bases in the organism, which are converted into uric acid and as such excreted by the urine. The good results obtained

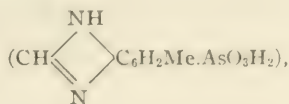
in the treatment of gout and rheumatism are therefore due only to a secondary action. Atophan itself is oxidized to oxyphenylquinoline carbonic acid, a product which is obtained in a similar way as atophan by replacing benzaldehyde by salicylic aldehyde.—Z. exp. Path. Therap.; through Pharm. Weekblad, 56 (1919), 407. (H. E.)

Barbital.—*Toxicity of.*—Gautier reports four cases of self-drugging or attempt at suicide in which 3.5, 5, 7 or 8 grammes of diethyl malonyl urea had been taken. One woman of 33 died after four days of coma and hyperpyrexia; the dose had been only 5 grammes. Necropsy revealed nothing but congestion of the brain and the bases of both lungs. Those taking this drug habitually seem less able to stand moderate doses than others. Death has occurred from a 3 gramme dose in the addicts, while recoveries are known after a single dose of 10 grammes. Treatment can be only symptomatic. Gautier protests against the unrestricted sale of barbital, particularly as it is liable to lead to morphine addiction.—Rev. méd Suisse Rom.; through Drug. Circ., 63 (1919), 186.

Benzodiazolearsenic Acids.—Baxter and Fargher report on the preparations of 1,3-benzodiazole (benzo-glyoxaline) derivatives from 3,4-diaminophenylarsinic acid and 5,6-diamino-*m*-tolylarsinic acid by the well-known reaction of *o*-diamines with formic or acetic acid, and the examination of the arsenobenzenes derived from them. It was hoped that the hydrochlorides of these arsenobenzenes would prove sufficiently less acid in reaction than salvarsan to admit of their being injected intravenously as such, and thus avoid the somewhat troublesome technique necessary in the administration of salvarsan. Though the acidity was considerably reduced, the products were still strongly acid to litmus, and, therefore, in view of secondary action, could not be so employed. A further interest lay in their relationship to hexaminoarsenobenzene and its *N*-methyl derivatives, which are stated to dissolve in alkali bicarbonates with the formation of carbonates possessing the same degree of alkalinity as blood serum and a relatively low toxicity. The reaction with formic acid was found to proceed normally in both cases, giving rise to 1,3-benzodiazole-5-arsinic acid,

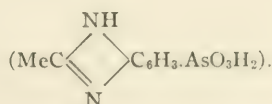


and 7-methyl-1:3-benzodiazole-5-arsinic acid,

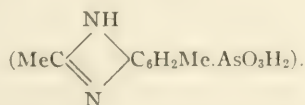


respectively.

With acetic acid, however, 3,4-diaminophenylarsinic acid gave rise to highly colored decomposition products, so it was converted into the diacetyl derivative, which, on subsequent treatment with water under pressure at 130°, yielded 2-methyl-1,3-benzodiazole-5-arsinic acid,



The reaction of 5,6-diamino-*m*-tolylarsinic acid with acetic acid proceeded normally with the formation of 2,7-dimethyl-1,3-benzodiazole-5-arsinic acid



All four acids yielded the corresponding arsenobenzenes on reduction with sodium hyposulphite or hypophosphorous acid, and were converted into the hydrochlorides by treating their suspensions in water with just sufficient hydrochloric acid to bring about solution, and then precipitating by an equal volume of concentrated hydrochloric acid.—Pharm. J., 103 (1919), 442.

Benzyl Alcohol.—While experience alone will tell whether or not the local anesthetic benzyl alcohol or phenmethylol will come up to the expectations of the discoverer of its action, it was deemed of sufficient promise by the Council on Pharmacy and Chemistry to warrant its admission to New and Non-Official Remedies.—J. Am. Med. Assoc., 72 (1919), 594. (W. A. P.)

Benzyl Alcohol.—*Antiseptic Action of.*—Macht and Nelson find that benzyl alcohol in aqueous solution is antiseptic to a number of organisms. A 0.5 per cent. solution kills the Friedländer bacillus within 19 hours, *Bacterium pyocyaneus* in 24 hours, *Bacterium coli*

communis in 72 hours. One per cent. solutions have much more marked and rapid bactericidal action.—Proc. Soc. Exp. Biol. Med. through Chem. Abstracts, 13 (1919), 2710.

Benzyl Alcohol.—*Preparation and Uses.*—A "Lecturer in Pharmacy" of the University of Sidney presents an interesting general paper on the chemistry, manufacture and anesthetic uses of benzyl alcohol.

It can be obtained by adding 100 grammes of benzaldehyde to a cooled solution of 90 grammes of potassium hydroxide in 60 mls of water and after 20 hours' standing the mixture, which has solidified because of the presence of potassium benzoate crystals, is liquefied by addition of water and then shaken out with ether. The mixed ethereal fractions are washed with saturated sodium bisulphite solution and after separation of the ether layer, it is filtered, the ether distilled and the residue of crude benzyl alcohol is purified by fractional distillation, the fraction coming over between 204 and 207° consisting of pure benzyl alcohol.—Chem. and Drug. of Australasia; through Am. J. Pharm., 91 (1919), 297.

Benzyl Alcohol.—*Properties of.*—A market specimen was found to be a colorless liquid of faint aromatic odor; with sharp burning taste; soluble in 25 parts of water; soluble in all proportions of ether and chloroform; boiling point, 201 to 206°; density at 15°, 1.0443 and at 25°, 1.0372.—Rep. Lab. Am. Med. Assoc.; through Chem. Abstracts, 13 (1919), 2107.

Benzyl Benzoate.—*Pharmacological and Clinical Data on.*—At the 1919 meeting of the American Medical Association at Atlantic City considerable interest was aroused by the papers read before the therapeutic section on the use of benzyl benzoate for medicine. D. I. Macht explained how his attention was first directed to this ester in the course of his investigation of the pharmacology of opium alkaloids. The pyridine phenanthrene group, represented by morphine, was found to stimulate the contractions of the ureter and increase their tonicity; whereas the benzyl isoquinoline group represented by papaverine had an opposite effect, inhibiting contractions and lowering the tonus of the plain muscle. This induced the author to experiment with the benzyl esters. These were found to act on the smooth muscle of the viscera, in a similar manner to papaverine. The benzoate was the ester finally selected for use.

It was administered in the form of a 1:5 alcoholic solution, flavored with a carminative, giving a dose of 10 to 30 drops in cold water. The author has satisfied himself, by personal experience, that the benzoate is practically non-toxic. It has been used with success in the following clinical conditions: excessive intestinal peristalsis, such as diarrheas and dysentery; intestinal, biliary, and renal colic; spastic constipation; vesical spasm; uterine colic; arterial spasm; and bronchial spasm of true asthma. J. C. Litzenberg dealt with the application of the drug to certain cases of dysmenorrhea. The antispasmodic action of the benzoate and its freedom from toxicity indicated that it might be serviceable in many of these cases. In the preliminary trial, the painful symptoms were relieved in 81 per cent. of the cases treated; pain was absolutely eliminated in 62 per cent. and greatly relieved in 18.5 per cent. The alcoholic solution originally prescribed by Macht was objected to on account of the unpleasantness of the after-taste. It was found to be much more palatable when prescribed in the following emulsion: Benzyl benzoate, 10 grammes; mucilage of acacia, 5 grammes; aromatic elixir of eriodictyon, 35 grammes. One-half to two teaspoonfuls every two hours, as needed.—J. Am. Med. Assoc.; through Pharm. J., 103 (1919), 234.

Betanaphthol Benzoate.—*Use as an Intestinal Antiseptic.*—Frederic Klein claims that betanaphthol benzoate is one of the best intestinal antiseptics.

Tests other than those given in the U. S. P. are set forth for identification and purity of the drug.—Pract. Drug., Feb., 1919, 22. (F. H.)

Bicyclic Ketones.—*Preparation of.*—Taboury and Godchot prepare unsaturated bicyclic ketones by use of calcium hydride, a new condensing agent which is now commercially available.—Compt. rend.; through J. pharm. chim., 20 (1919), 234.

Calcium Creosotate.—*Preparation and Uses of.*—An excess of freshly prepared calcium hydroxide, about 4 or 5 lbs., is introduced into a percolator, and 1 lb. of creosote is then stirred into the powder. After the mass has cooled, water is poured in so as to produce a magma, and then the liquid is allowed to run slowly, and, if necessary, passed through a second time, or until its specific gravity is 1.010 to 1.012. A sudden drop in the gravity indicates that most of the calcium-creosote has been dissolved, and then another pound

of creosote should be added and the process repeated. The resulting solution is a light refractory, reddish yellow liquid, becoming brown on keeping, and depositing a precipitate of calcium carbonate on exposure to air. It has the odor of creosote, and a sharp, peppery taste. It gives a strong alkaline reaction, and possesses marked antiseptic properties. A patient is able to take about 4 fluidounces of the solution *per diem*, equivalent to 96 drops of creosote, or 3 minims in each fluidrachm. Its use is stated to give excellent results in pneumonia, typhoid fever, etc. It affords a means of administering creosote in adequate doses without, as a rule, producing intolerance.—Pharm. J., 103 (1919), 251.

Catechol-Boric Acid.—Boeseken, Obreen and Van Haeften have prepared the ammonium potassium salts of this acid which has the formula $H_2(C_6H_4O_2)_3B_2O_4$. The salts are made by shaking together concentrated solutions of boric acid, catechol and the proper hydroxide, the molecular proportions of the three chemicals being 1:2:1. The salts are obtained as white leaflets. Various aniline salts of the acid were prepared and are described.—Rec. trav. chim.; through Am. J. Pharm., 91 (1919), 554.

Chloramine Preparations.—B. Deplas suggests the following:

CHLORAMINE OINTMENT.

Wax.....	100 grammes
Sterilized olive oil.....	200 grammes
Balsam of Peru.....	3 grammes
Tincture of benzoin.....	3 grammes
Chloramine-T.....	4.5 grammes

CHLORAMINE SURGICAL POWDER.

Chloramine-T.....	1 gramme
Zinc stearate.....	10 grammes
Sodium stearate.....	89 grammes

Presse med.; through Am. J. Pharm., 91 (1919), 697.

Chloramine-T.—*Use as Intestinal Antiseptic.*—Carnot and Bondouy have studied this use of chloramine-T from the bacteriologic and clinical standpoint. They conclude that it is of value in cases of gastric disturbance characterized by fetid stools and diarrhea, in bacillary dysentery and in intestinal toxic infections. In catarrhal icterus, in chronic enterocolitis and in amebic dysentery, little or no results were obtained. Since it is decomposed by the

gastric and duodenal juices, it should be protected during its passage through the stomach. The authors find this is best effected by dispensing in cachets or tablets chloramine-T 0.05 gramme and powdered animal charcoal, 0.3 gramme, four such cachets or tablets being given daily.—*Presse méd.*; through *Am. J. Pharm.*, 91 (1919), 474.

Dichloramine-T.—*Precautions in Handling.*—W. E. Lee discusses the handling of this product and its solutions. The main precaution is that no moisture must come in contact with it, hence containers should be perfectly dry and droppers, pipettes or syringes must be water-free.—*Am. Surg.*; through *Am. J. Pharm.*, 91 (1919), 123.

Dichloramine-T and Chlorcosane.—E. H. Hessler describes the composition and medical uses of dichloramine-T and its solvent chlorcosane.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 265. (R. P. F.)

Cinnamene.—*Synthesis of Benzylidene Acetone from.*—G. Langlois reports that when acetyl chloride and cinnamene react in the presence of stannic chloride, the hydrochloride of benzylidene acetone, $C_6H_5CHClCH_2COCH_3$ results. From this, the chlorine can be removed by action of diethylaniline, when benzylidene acetone, $C_6H_5CH = CHCOCH_3$, is obtained.—*Compt. rend.*; through *J. pharm. chim.*, 20 (1919), 136.

Dulcin.—*Detection in Foods.*—Dulcin, or sucrol (para-phenetol carbamide) can be detected by extracting the substance under examination with acetic ether, evaporating the solvent and heating the residue with two to four drops of a neutral mercuric nitrate solution. In the presence of dulcin a red color is produced which changes to violet on the addition of lead oxide to the mixture. Acid beverages, such as lemonades, should first be rendered alkaline before extracting with acetic ether to render any saccharin present in the liquid insoluble.—*Chem. Ztg.*; through *Drug. Circ.*, 63 (1919), 381.

Iodoantipyrine.—*A Hypiodous Derivative.*—J. Bougault finds that iodoantipyrine reacts with potassium iodide and hydrochloric acid similar to hypiodides as shown in the following equation:

$C_{11}H_{11}IN_2O + KI + HCl = C_{11}H_{12}N_2O + I_2 + KCl$. He has been unable to find any organic iodine compound that behaves similarly, although he experimented with a number of such bodies.—*J. pharm. chim.*, 20 (1919), 245.

Metol.—*Manufacture of.*—R. N. Harger reports that in making this developer by the Merck process better results were obtained employing a lower temperature and a shortened reaction period. Heating 20 grammes of quinol with 2 equivalents of aqueous methylamine (N/10) in a sealed tube, for four hours, at 200° , and then pouring the product into a quantity of 5 per cent. sulphuric acid, equivalent to the methylamine employed, concentrating, and cooling with ice, resulted in a total yield 73 per cent. of the theoretical yield. This includes the quantity obtained from the mother liquor. Heating metol to 245° causes it to char, and at between 250° and 260° , it melts with decomposition. It dissolves in 20 parts of water at 25° , and in 6 parts of boiling water. Brought into reaction with mercuric acetate an intense purple coloration results, which reaction may be employed to estimate metal colorimetrically. This reaction is negative with quinol and *p*-aminophenol salts. Amidol (2,4-diamidophenol) reacts in a similar manner.—*J. Am. Chem. Soc.*, 41 (1919), 270. (G. C. D.)

Monomethylanilin.—*Yield of.*—Challenger says that in the preparation of monomethylanilin, 55 per cent. of the theoretical yield was obtained by condensing aniline with formaldehyde, with subsequent reduction by zinc and sodium hydroxide, the yield being practically free from tertiary base. The presence of an excess of formaldehyde increased the amount of dimethylanilin formed. Autoclave and sealed tube experiments indicated that 56 per cent. of the theoretical yield of monomethylanilin was the highest amount obtainable.—*Chem. and Drug.*, 91 (1919), 152. (K. S. B.)

Nitrobenzene.—*Poisonous Ingredient of a Shoe Dressing.*—R. E. Stifel reports seventeen cases of severe cyanosis (methemoglobinemia) due to black shoe stain. The cases apparently developed soon after the shoes had been stained and apparently were caused by the presence of nitrobenzene in the stain.—*J. Am. Med. Assoc.*, 72 (1919), 395. (W. A. P.)

Novarsenobillon.—*Preparation of Solution of.*—Anwyl Davies describes the method adopted at St. Thomas's Hospital for ad-

ministering novarsenobillon intramuscularly. The following solution is prepared:

Guaiacol.....	1 part
Pure liquid glucose.....	50 parts
Water (recently sterilized) to make.....	100 parts

The water and glucose are sterilized and the guaiacol is added when cold. Of this solvent 10 to 20 minims are taken and the novarsenobillon powder is dissolved in it, which it readily does, even when the dose is as large as 0.75 gramme. The injection is made with this amount.—*Lancet*; through *Chem. and Drug.*, 91 (1919), 453.

Phenol.—*American Production of.*—Some interesting facts on the consumption and production of phenol are summarized by A. G. Peterkin. Before the war this country's consumption of phenol was about 9,000,000 pounds per year, the bulk of which came from England, and was obtained from coal-tar distillates directly. A small part was synthesized from benzol. The general impression here is that this synthetic phenol was made in German plants, subsidized, and kept in existence by the Government for war purposes. The production at the time of our entry into the war amounted to 75,000,000 pounds per year, and after that time plants were erected so that we had a capacity to produce more than 150,000,000 pounds. Of this, not more than 2,000,000 pounds were obtained directly from coal-tar distillates by extraction with caustic soda. The consumption in this country is not much greater than 6,000,000 pounds per year, about equally divided between the drug and disinfectant, the dyestuffs, and the synthetic resin industries. When the armistice was signed, the manufacture and use of phenol on a large scale ceased, leaving a supply in private and government hands, which at the very least amounted to 30,000,000 lbs. of phenol.—*J. Ind. Eng. Chem.*, 11 (1919), 475.

Phenol.—*Iodination of.*—After consideration of the various methods for iodination of phenol, V. Cofman found hypiodous acid, which breaks up into iodide and iodate, to be formed in all, and concludes that this acid is the actual carrier of the iodine and effects its entrance into the phenol molecule.—*Chem. and Drug.*, 91 (1919), 599. (K. S. B.)

Phenol.—*Melting Point of.* H. Leroux recommends that the congealing point rather than the melting point should be the cri-

terion selected in the official test for phenol. This is found to be 41° (corr.). It is claimed that the determination is more likely to give correct results than the reading of the melting point. The sample should be brought to about 42° in a small cylinder, then slowly cooled to obtain a condition of superfusion, a thermometer graduated in $1/10$ degrees being immersed in the liquid. A few crystals of phenol are then added, when the liquid quickly crystallizes and the temperature rises. The highest reading of the thermometer is taken as the congealing point. The presence of 0.5 per cent. of water lowers this to 38.8° ; 1 per cent. to 36.9° ; 1.5 per cent. to 35° ; and 2 per cent. to 33.2° .—J. pharm. chim.; through Pharm. J., 103 (1919), 217. (H.)

Phenols and Terpene Alcohols.—*Phenylurethanes of.*—A simple method for making these substances is given by F. Weehuizen. About one gramme of the terpene alcohol or phenol is dissolved in 6 to 10 mls of that fraction of coal oil which boils between 170° and 200° and after the addition of the calculated amount of phenylisocyanate, the mixture is refluxed for one-half to one hour. After cooling the crystals are collected on a Büchner funnel, washed with cold petroleum ether (b. p. $80-100^{\circ}$) and finally recrystallized from boiling benzine. The phenylurethans of *o*-cresol, *p*-cresol, *m*-cresol, thymol, menthol, borneol, etc., were prepared. The method may be used for separating camphor from borneol, because only the latter reacts with phenylisocyanate, forming crystalline bornylphenylurethane, while camphor remains in solution.—Pharm. Weekblad, 56 (1919), 299. (H. E.)

Phenolsulphonphthalein.—*Use as Indicator in Titration of Alkaloids.*—George Éwe reports experiments in which phenolsulphonphthalein was used as an indicator in titrating various alkaloids and acid solutions. The results show phenolsulphonphthalein is a useful indicator for the titration of plain acid solutions, although the fact that it fades gradually must be taken into consideration. It is not as satisfactory as methyl red for the titration of alkaloids because the end reaction is not as sharp and not as permanent, therefore yielding low results.—Proc. Penna. Pharm. Assoc., 42 (1919), 173. (R. P. F.)

Pyrogallol Ethers.—*Synthesis of.*—Bogert and Ehrlich, with the generalizations of Chassevant and Gariner in mind that triatomic

phenols as a class are less toxic than monatomic phenols and that alkylation of a phenolic hydroxyl tends to reduce its poisonous action, carried out a series of experiments in the hope that a dialkyl oxy derivative of the ordinary phenacetine of commerce might be synthesized which would retain the valuable antipyretic and analgesic properties of the latter and at the same time show reduced toxicity. Having had considerable experience in the preparation of syringic acid, it was chosen as the initial material for this research being converted first into its ethyl ether then into the chloride amide of the latter, the amide yielding 3,5-dimethoxyphenetidine when subjected to the Hoffman reaction. Acetylation of this body gave the compound sought, namely, 3,5-dimethoxyacetphenetide in the form of its monohydrate.

A preliminary pharmacological study of this new compound by Prof. Chas. C. Lieb of the College of Physicians and Surgeons, Columbia University, shows that it possesses decided antipyretic action. Whether its toxicity is much less than that of phenacetine itself is as yet undetermined, experiments hitherto having shown only that it is not more toxic. They hope to continue a study of the entire problem as opportunity offers.—J. Am. Chem. Soc., 41 (1919), 798. (J. L. M.)

Pyramidon.—*Use in Analysis.*—Eschaich points out that pyramidon is a particularly sensitive reagent for detecting oxidants, being preferable for this purpose to phenolphthalone or tincture of guaiac. A 10 per cent. alcohol solution when combined with oxidants gives a deep blue color. This blue color is shown in each of the following tests:

For nitrites: 2 mls of the reagent, 2 mls of the water examined and 10 to 12 drops of glacial acetic acid.

For blood: 1 mil of pyridine, 1 mil of the reagent, 2 drops of solution of hydrogen dioxide to which is added, drop by drop, an aqueous mixture of the blood under examination.

For raw milk: 1 mil of pyridine, 1 mil of the reagent, 2 to 3 drops of hydrogen dioxide solution, 2 mls of milk and 10 to 12 drops of acetic acid. Heated milk does not give the reaction.

For cyanides: 1 mil of the reagent, 1 mil of copper sulphate solution (0.25 per cent.), 10 to 12 drops of glacial acetic acid, and then the cyanide solution, drop by drop.

For copper salts: 1 mil of the reagent, 1 mil of cherry laurel water (or other dilution of hydrocyanic acid), 10 to 12 drops of glacial acetic acid.

The author suggests several other cases in which the pyramidon reaction can be utilized but does not give details.—*J. pharm. chim.*, 20 (1919), 49.

Pyrocatechol and Adrenaline.—*Test for.*—Grimbert and Leclère have shown that the bluish green color which solution of apomorphine develops on exposure to the air is produced at once when the solution is heated with sodium acetate and mercuric chloride. This very delicate reaction may be obtained with morphine or any of its direct derivatives. A mixture of a few milligrammes with two or three drops of strong sulphuric acid is warmed until a brownish color is developed. Five mls of saturated solution of sodium acetate and two mls of saturated solution of mercuric chloride are then added. On boiling, the green color appears. According to G. Denigès, under similar conditions, pyrocatechol gives a reddish violet color. The coloring matter formed is soluble in ether, in chloroform, and in amyl alcohol. Adrenaline, when treated with the same reagents, gives in the cold, a deep red color. This is formed more rapidly at 40–50°, but the temperature must not exceed 70–80°, or the color will be destroyed. The reaction is very sensitive and sufficiently definite to serve for the colorimetric determination of adrenaline.—*Bull. soc. pharm. Bordeaux*; through *Pharm. J.*, 102 (1919), 426.

Sulphonal.—*Properties of.*—A. Falck found that 1 gramme of sulphonal required the following quantities of solvent for complete solutions: Water (at 18° C.), 423 grammes; (at 100°), 8 grammes; 90 per cent. alcohol (at 15°), 60 grammes; ether (at 17° C.), 79 grammes; chloroform (at 20°), 3.3 grammes; methylene chloride, 2.8 grammes; benzene (at 17°), 12.7 grammes; ethyl acetate, 13.7 grammes; toluene, 19.3 grammes; carbon tetrachloride, 110 grammes; carbon bisulphide, 440 grammes; 2 per cent. sodium chloride solution (at 18°), 440 grammes. Sulphonal begins to volatilize at 60° under ordinary pressure and is appreciably volatile with steam; on this account, sulphonal solutions should not be concentrated by evaporation before analysis. Extraction with chloroform and evaporation of the solvent at a low temperature is recommended for the determination of sulphonal in its aqueous solution. Sulphonal may be recovered from decomposing animal matter even after long contact; characteristic crystals of the substance are obtained from its ether or chloroform solution.—*Pharm. Zent.*; through *J. Soc. Chem. Ind.*, 38 (1919), 962A.

T. N. T.—*Treatment of Poisoning by.*—Gregorson and Taylor describe five cases of T. N. T. poisoning, two of which were fatal. The paper describes symptoms, diet and medical treatment.—Glasgow Med. J.; through Am. J. Pharm., 91 (1919), 123.

Thiocol.—*Properties of.*—C. H. Grau gives a brief report on this potassium guaiacol-*o*-sulphonate, which is commonly called *thiocol*. He discusses its examination as to purity, finding that the main impurity in commercial samples is potassium carbonate.

Grau finds that recrystallized thiocol melts at 212–215° and that it contains about 3 per cent. of water. With ferric chloride it gives a precipitate and a yellow solution; with sulphuric acid it turns gray-violet and then green on heating to 160°; while with sulphuric acid and formaldehyde it gives a deep violet.—Bull. soc. pharmacol.; through Chem. Abstracts, 13 (1919), 1366 and 1742.

Vanillin.—*New Source of.*—It is well known that potatoes, especially the layer next the peel, have a noticeable vanilla flavor, but no extraction of vanillin from them has so far been recorded. Potato flowers, however, which rarely have any vanilla scent, contain appreciable quantities of this substance. Lippmann finds that certain bluish potato flowers have a strong scent of vanilla, which is purest and strongest in the early morning hours, and disappears almost completely under the influence of the sun's rays. The plucked flowers also rapidly lose their vanilla odor. The ether extract of the flower gave a bisulphite compound, from which very fine crystals of vanillin were obtained, melting at 81°, and subliming without decomposition. Analyses corresponded with the formula $C_8H_8O_3$. The odor and taste were identical with those of vanillin, and the characteristic blue color with ferric chloride was readily obtained. The practicability of the cultivation of special varieties of potato as a source of vanillin is left for experts to decide.—Ber.; through Pharm. Era, 52 (1919), 264.

Vanillyl-Acyl Amides.—*Preparation of.* Finding that capsaicin is vanillin-decenoyl amide (see page 537), E. K. Nelson prepared the following vanillyl amides: *Vanillyl acetamide*, monoclinic rods, melting at 84–85°. *Vanillyl propionamide*, short rhombic rods, melting at 108–110°. *Vanillyl n-butyramide*, minute triclinic rods, melting at 68–70°. *Vanillyl iso-butyramide*, rhombic plates and pyramids, melting at 118–120°. *Vanillyl n-hexanamide*, viscous syrup. *Vanillyl n-heptylamide*, monoclinic grains, melting

at 59–61°. *Vanillyl n-octoylamide*, minute needles, melting at 41–43°. *Vanillyl n-nonylamide*, minute needles, melting at 52°. *Vanillyl n-decoylamide*, rhombic flakes and needles, melting at 59–60°. *Vanillyl n-undecoylamide*, irregular triclinic plates, melting at 54–56°. *Vanillyl n-dodecylamide*, monoclinic plates, melting at 60–61°. *Vanillyl crotonylamide*, rhombic rods, melting at 119–120°. *Vanillyl undecenoylamide*, minute rhombic needles, melting at 53–55°. *Vanillyl benzoylamide*, short rhombic rods, melting at 140–142°. Details of manufacture and crystallographic readings of all of these are given in the paper. Of these synthetic amides, the first four have no pungency. The others vary in pungency, the most pungent being the nonylamide, which approaches capsaicin in burning taste.—J. Am. Chem. Soc., 41 (1919), 2121.

Tar Oils.—*Production in Germany.*—H. Grossmann states that successful attempts have been made during the war to render Germany independent of foreign sources of substances hitherto derived from imported petroleum oil. Large quantities of "tar oils" have been obtained from coal. This oil is a portion of the anthracene oil which distils over between 300° and 360°. Crude anthracene and phenanthrene are removed therefrom by cooling, crystallization and filtration. The more easily vaporized constituents are removed from the filtered anthracene oil which is once more cooled, and the last solid constituent precipitated. The oil so obtained serves for the preparation of various lubricating oils. By long-continued heating at a high temperature a very viscous oil is obtained which was much used during the war. The tar oils can be mixed with mineral oils, and can be used for manufacture of lubricating greases.—Pharm. Era; 52 (1919), 314.

FIXED OILS AND FATS.

Benefing Oil.—Benefing seed from a plant which grows wild in the Niger district and also in Madagascar, where the natives term it "voa matavy," contains a drying oil which can replace linseed oil for industrial purposes. The oil, extracted from the seeds by primitive methods, is used in all the workshops of the Kayes railway in the Niger district. In Madagascar it is used as an edible oil.—J. Soc. Chem. Ind.; through Pharm. Era, 52 (1919), 264.

Cacao Butter.—*Mouldy.*—Batten and Bywaters report on a 28 pound block of oil of theobroma which showed in the interior a growth of mould which proved to be *Aspergillus oryzae*. Experiments aiming to show cause of this growth were not entirely satisfactory, although the authors incline to the belief that it was due to the presence of moisture within the fat mass.—J. Soc. Chem. Ind.; through Am. J. Pharm., 91 (1919), 112.

Castor Oil.—*Production in Ceylon.*—Some time ago the Ceylon Government decided to open up some acres of land at Madawachchi for growing the castor plant. It is now ascertained that the experiment has proved successful and the yield per acre is estimated at 750 to 850 lb. of seed. The seed will be crushed, as the process involves very slight expense.—Chem. and Drug., 91 (1919), 483.

Castor Oil.—*Use as Fly Poison.*—Boyé and Guyot find that castor oil, either alone or mixed with sugar is very attractive to house flies, and is, at the same time, an active poison for them. That the fatal action is not solely mechanical is shown by the fact that other oils, such as olive and nut oil, have no such toxic action under similar conditions. The addition of croton oil in the proportion of two drops to the ounce of castor oil greatly increases the toxic action on flies, and in this small proportion cannot be considered dangerous to animals.—J. pharm. chim.; through Pharm. J., 102 (1919), 389.

Castor Oil.—*Use in Dermatology.*—D. W. Montgomery states that this oil is of greater value in dermatology because (a) it withstands heating better than most oils; (b) its solubility in alcohol makes it of service in scalp troubles; (c) its solvent action on salicylic acid; (d) its internal purgative and cleansing action aids the dermatologist in his efforts to produce a clean cutaneous surface.—J. Cutan. Dis.; through Am. J. Pharm., 91 (1919), 554.

Oil of Cavete.—This oil obtained from *Omphalea megacarpa*, growing in Brazil, is suggested as a possible substitute for castor oil. It is described as being a liquid at ordinary temperatures, of a pale straw color, and having a slight but not unpleasant odor. In addition to its peristaltic action, it has diuretic properties, but the exact mode of its action has not yet been definitely ascertained. The dose is about 4 grammes. It is regarded as a valuable non-irritant cathartic, and its activity does not appreciably decrease

with age. It differs widely from castor oil in composition, being optically inactive, not viscous, and only slightly soluble in alcohol.—Pharm. Era, 52 (1919), 44.

Oil of *Ceratotheca Sesamoides*.—E. R. Bolton states that *Ceratotheca sesamoides*, which grows on the Gold Coast, is closely allied to *Sesamum indicum*. The seeds are very similar, and so are the oils; in fact all the analytical results which are given in the paper, with the exception of the Baudouin reaction (negative for *Ceratotheca sesamoides*), might be given by sesame oil. The oil would be useful in edible products. The following analytical figures were obtained for the oil:

Saponification value.....	190.20
Unsaponifiable matter.....	1.53%
Iodine value.....	110.60
Refractive index at 40° C., Zeiss.....	59.60
Free fatty acids (as oleic).....	0.63%
Specific gravity 15° C.....	0.9163
Baudouin reaction.....	negative
Halphen reaction.....	negative

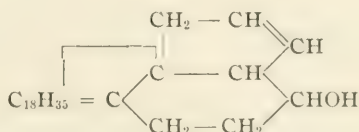
—The Analyst, 44 (1919), 233. (J. K. T.)

Chaulmoogra Oil.—*Acidity of.*—V. Cofman finds that the acidity of this oil varies with age and methods of extraction. In view of his data he concludes that the limits for acidity of the British Pharmacopœia are too narrow and should either be extended or entirely omitted.—Pharm. J., 103 (1919), 269. (C. W. B.)

Chaulmoogra Oil.—*Use in Leprosy.*—Hollmann and Dean have seen cases in which the manifestations of the disease have disappeared and the lesions become bacteriologically negative from the administration of chaulmoogra oil alone. Two patients subsequently had a recurrence of the disease, one within seven months, and one within two years. Twenty-six patients were treated with fractions of the fatty acid isolated by Dean from chaulmoogra oil. Hollmann is convinced that these fractions are superior to chaulmoogra mixtures. They are administered more easily, a much smaller dose is required at each injection, and there is more marked and more rapid amelioration of the disease. In the use of the ethyl ester of these fractions subcutaneously, the authors have noticed

reactions in the leprous lesions. In six months' time large nodules have entirely disappeared, leaving deep crater-like scars. Of the twenty-six patients treated, seventeen showed marked improvement; one patient showed slight improvement and only three patients showed no improvement, being under treatment only three months or less. Of the twenty-six patients treated, eight have become bacteriologically negative in less than two years.—J. Cutan. Dis.; through Drug. Circ., 63 (1919), 504.

Cholesterol.—*Structure of.*—Windaus and Dalmer continue the work of the former on the structure of cholesterol. They decide that this body has the formula



In another paper the possible structure of the double ringed group, $\text{C}_{18}\text{H}_{35}$, is discussed.—Ber.; through Chem. Abstracts, 13 (1919), 1844.

Coconut Oil.—*Adulterated.*—R. W. Terry reports that a certain lot of coconut oil behaved in a somewhat peculiar manner upon cooling after being melted. As the oil cooled and when the bulk of it was still liquid there appeared throughout the liquid numerous large bodies of solids. These were about three-quarters of an inch in diameter, flat on one side and rounded on the other, just like a half-sphere. In the center of the flat side there appeared to be a nucleus with numerous radiations extending to the edge; also a large number of concentric rings about the nucleus. All in all they resembled beef-stearin formations as crystallized from ether and examined microscopically.

The oil analyzed as follows:

	Sp. Gravity.	Iodine No.	Saponification Val.
Sample examined.....	0.9352 at 25	15.3	255.3
	25		
True coconut oil.....	0.9114 at 40 C.	8 to 9.5	258.0
	25		

—Midland Drug., 53 (1919), 132. (A. G. B.)

Cockle Burr Oil. —L. B. Rhodes has been experimenting with cockle burrs, and has succeeded in extracting from them an oil which may be used, like cottonseed oil, as a food, and also, being a drying oil, in the manufacture of paints and varnishes.—*Drug. Circ.*, 63 (1919), 222.

Cod Liver Oil.—*Preparation of Sodium Morrhuate from.*—L. Rogers boils 100 grammes of cod liver oil, 20 grammes of sodium hydroxide (dissolved in the same volume of water), and 200 mls of rectified spirit on a water-bath under a reflux condenser for about four hours. The solution is then mixed with a little water, and exactly neutralized with dilute sulphuric acid. Some of the alcohol is then recovered, and the solution mixed with nearly 200 grammes of fairly large grained sand (washed with hydrochloric acid and water), and the whole quickly evaporated to dryness on the water-bath. The dry residue is then extracted with ether in Soxhlet's apparatus (using ice water in the condenser), and the fatty acids liberated by a slight excess of the calculated quantity of dilute sulphuric acid (say, a diluted solution of nearly 18 mls of strong sulphuric acid of sp. gr. 1.82). The fatty acids liberated are washed several times with water to free from sulphuric acid, and then neutralized (using phenolphthalein as indicator) with a solution of pure sodium hydroxide, using much rectified spirit, and as little water as possible. The neutral solution is quickly evaporated to dryness on the water-bath. A 3 per cent. solution of this he uses hypodermically and intravenously for tuberculosis.—*Brit. Med. J.*; through *Pharm. J.*, 103 (1919), 434.

Cod Liver Oil.—*Standard for Preparations.*—A standard of 33 per cent. cod liver oil content for preparations containing this substance is suggested by Howarth, a medical officer of the City of London, he having examined preparations whose oil content ranged from 6.3 per cent. to 48.1 per cent.—*Chem. and Drug.*, 91 (1919), 470. (K. S. B.)

Cottonseed Oil.—*Color Standards for.*—Army, Kish and Newmark suggest as color standard for cottonseed oil, the use of certain chemical solutions in place of the Lovibond scale.

As color standards they propose the use of various mixtures of certain basic solutions known as "Co-Fe-Cu" and "Co-Cro-Cu" fluids. The "Co-Fe-Cu" is prepared by blending a red N/2 solu-

tion of cobalt chloride, a yellow N/2 ferric chloride solution and a blue N/2 copper sulphate solution, all of the above solutions to be prepared with 15 per cent. hydrochloric acid.

The "Co-Cro-Cu" fluids are prepared from three basic fluids, a red N/10 cobaltamine solution, a yellow N/10 ammonium chromate solution and a blue N/10 cuprammonium sulphate solution, all of the above solutions being made by dissolving the required amount of reagent in 2.8 per cent. ammonia water.

A set of color standards is prepared by mixing varying amounts of the primary solutions to produce the tint of color desired. Tables are given for preparing a large number of color standards.

It is claimed that the color standards are uniform and quite permanent and that their employment saves the cost of expensive appliances.—J. Ind. Eng. Chem., 11 (1919), 950. (L. A. B.)

Elderberry Oil.—*Dangerous.*—According to Thoms, the German War Committee for Oils and Fats issued a warning against the use of the oil obtained from elderberries, either by expression or by solvents, for edible purposes. The injurious effects it produces are due to the oil contained in the seeds; that contained in the pulp is edible, but it is present only to the extent of 0.16 to 0.65 per cent. calculated upon the fresh pulp, and would not pay for extraction.—Pharm. Ztg.; through Pharm. J., 102 (1919), 34.

Oil of Evening Primrose.—Heiduschka and Luft find that the dried seed of *Oenothera biennis* contain 13.95 per cent. of moisture, 13.38 per cent. of proteins, 16.93 per cent. of oil, 14.56 per cent. of fiber, 35.03 per cent. of non-nitrogenous extractive and 6.15 per cent. of ash. The oil is golden yellow, begins to solidify at -11° ; has the density, 0.9283; refractive index, 1.4722; acid number, 0; saponification number, 195.2; iodine number, 148.92; Reichert Meissl number, 2.61; Polenske number, 0.57; Helmer number, 94.94, and acetyl index, 13.9. It is optically inactive and is a drying oil. From it the authors obtained the following acids: gamma-linolenic, alpha-linoleic, beta-linoleic, oleic, palmitic, daturic and hexoic (0.81 per cent.).—Arch. Pharm.; through J. Pharm. chim., 20 (1919), 356.

Fats.—*Determination of the Melting Point of.*—D. J. de Jong found that the melting point of fats varies considerably with the width of the tube, the height of the fat column and the rate of heat-

ing. A long column of fat and a rapid heating gives too high a melting point. Thin-walled narrow tubes (1 mm.) give a higher melting point than thin-walled wide tubes (5 mm.). A lower melting point is obtained when the fat column is submerged far below the surface of the liquid, or when a short fat column is used and the temperature is raised rapidly, and finally when a glycerin bath is used in place of a water bath. Fairly constant results can be obtained by using a thin-walled narrow tube, a fat column about 10 mm. long, the upper edge of which is submerged 10 mm. below the surface of the bath and heating the bath at the rate of 1 to 2° per minute. Rancid fats give very irregular melting points.—Pharm. Weekblad, 56 (1919), 925. (H. E.)

Fats.—*Service in the Assimilation of Albuminoids.*—F. Maignon has previously shown that in the presence of fats the toxicity of albuminoids of food is diminished and their nutritive value is increased. When fat is present the minimum quantity of albumin necessary to maintain weight is only about one-third that required when starch replaces fat. The amount of starch-albumin ration necessary to maintain weight contains about one-fourth more calories than a similar fat-albumin ration. It has long been known that the administration of fats, and especially oil-containing seeds and milk, assists assimilation. This was formerly attributed to the stimulation of the digestive secretions by the fat. But this explanation is not sufficient. Fats intervene in the synthetic reconstruction of protein molecules. Maillard has shown that glycerin acts as a condensing agent with the amino-acids. The author finds that it acts on the —CO—NH— linkage which occurs in the amino-acids of protein molecules. It also plays an important part through its alcohol function, being temporarily esterified and then saponified. The sugars, as polyatomic alcohols, probably play the same role. Probably, however, the importance of these properties of glycerin are secondary to those of the fatty acids. It is known that fatty acids may be formed from proteins, such as casein. Probably the reverse action occurs in the organism. Baudi has demonstrated that fatty and amino-acids combine, forming lipoproteids, in which the physical and chemical properties of the fats are completely masked. Thus it is probable that the fatty acids combine with the residues of the amino-acids derived from ingested albumins, and thus render them assimilable. This explains the favorable action of fats on the digestion of albuminoids

and also the observed benefit which follows the administration of such fats as cod-liver oil in cases of malassimilation of nitrogenous foods, in diabetic or tubercular cachexia.—Compt. rend.; through Pharm. J., 102 (1919), 426.

Fatty Acids.—*Assay in Fats and Soaps.*—When fatty acids are assayed in fats and soaps by the usual shaking out method with ether, two errors are liable to occur which generally compensate each other, an oxidation of the unsaturated fatty acids and a loss of the volatile lower aliphatic acids on evaporating the ether. In order to avoid these errors, Bosshard and Comte recommend the following process based on the conversion of the fatty acids into their lead salts by means of lead oxide. In the assay of soap 5 grammes of hard soap or 10 grammes of soft soap is dissolved in water, the aqueous solution rinsed into a Huggenberg and Stadlinger sapometer which contains a slight excess of normal sulphuric acid and a few drops of methyl orange and sufficient water is added to obtain 100 mls. The mixture is then shaken with 50 mls of a mixture of equal volumes of ether and petroleum ether and 50 mls more of the same mixture is added. When the two liquids have completely separated, the acid solution is drawn off and the ethereal liquid shaken with 100 mls of water. The volume of ethereal solution is then noticed and an aliquot part (25 mls) is transferred to a vacuum flask, shaken with 5 grammes of pure lead oxide and a few pieces of pumice, both accurately weighed, the ether is evaporated at a low temperature under diminished pressure and the residue dried at 60° for 20 minutes. The increase in weight corresponds to the amount of fatty acid anhydrides in 25 mls of the ethereal solution.—Helv. Chim. Acta; through Pharm. Weekblad, 56 (1919), 407. (H. E.)

Oil of Fenugreek.—H. E. Wunschendorff find that fenugreek seeds contain about 7 per cent. of a golden yellow oil, having a very characteristic and disagreeable smell and taste. The oil belongs to the group of drying oils; it does not give the elaidin reaction; when a thin layer of it is spread on glass it rapidly solidifies and the golden yellow varnish thus obtained is not soluble in ether. The oil dissolves in all proportions in ether, benzin, carbon disulphide, and petroleum ether. Absolute alcohol in the cold dissolves only one part in 20, and larger quantities on warming. Acetone dissolves it incompletely. The density of the oil at 15° is 0.9471 and the index of refraction at 22° is 1.4774. The saponification and

iodine indices are 189.5 and 137.8, respectively. The oil contains 92.9 per cent. solid fatty acids and 1.50 per cent. volatile fatty acids. Lecithine is present in it in the proportion of 6.25 per cent. and phytosterine in the proportion of 0.5 per cent. The fatty acids present are chiefly linoleic and palmitic, with much smaller quantities of linolenic and oleic.—J. pharm. chim.; through Chem. News, 119 (1919), 11.

Fish Oil.—*Detecting Mineral Oils in.*—Condelli directs heating the oil under examination with five times its weight of sulphuric acid on a water-bath for forty-five minutes. After allowing the mixture to cool, the separated mineral oil is either measured directly or the mixture is extracted with ether or any other suitable solvent, the solvent is evaporated and the residue measured.—Boll. chim. farm.; through Drug. Circ., 63 (1919), 329.

Fixed Oils.—*Iodine Determination of.*—At a meeting of the Society of Public Analysts, John Allan stated that in certain processes involving changes in the composition of oils, control is obtained by determination of the iodine value. The sequence of operations is described and the arrangements made to secure the carrying out of a large number of iodine value determinations in a minimum of time. The subdivision of certain varieties of oleaginous seeds preparatory to analysis is attended with difficulty, as they easily form pastes which clog ordinary milling machines, and give a product, the extraction of which is highly unsatisfactory. The machine described overcomes this and other difficulties, and besides being easy to operate gives a product in a highly suitable condition for subsequent treatment in analysis.—Pharm. J., 102 (1919), 194.

Fixed Oils.—*Study of Reactions of.*—Frederick Klein found upon careful research that almost all of the reactions of the vegetable oils depend upon the color of the chlorophyll.

The three reagents mentioned by the author for oil analysis are:

Komarowski Test: Salicyl aldehyde in 95 per cent. alcohol and conc. sulphuric acid. *Bellerie Test:* Saturated solution of resorcin in C. P. benzol subsequently treating oil with nitric acid. *Schultz's Reagent:* Solution of picric acid in ether or benzol.

In conclusion the paper contains the author's results of these and other tests on vegetable, mineral and mixed oils.—Pract. Drug, May (1919), 26. (F. H.)

Fixed Oils.—*Unusual Types of.*—A. Ferencz reports on the following oils produced on the experimental drug farm at Kolozsvár:

Carthamus oil, from the seed of *C. tinctorius*, yield about 20 per cent.; light yellow; density, 0.9257 at 15°; acid number, 0.4; saponification number, 193.53; Hehner number, 96.15; Winkler iodine number, 147.63; Reichert-Meissl number, 2.53; Polenske number, 0.60; n_D , 1.4735 at 25°.

Belladonna oil, yield 10 per cent. cold pressed and 15 per cent. hot pressed; golden yellow, tasteless, non-toxic; density, 0.9258 at 15°; n_D 1.4726 at 25°; acid number, 0.70; saponification number, 191.16; iodine number, 145.22; Hehner number, 95.6; Reichert-Meissl number, 2.86; Polenske number, 0.45.

Staphylea oil, yield, 40.10 per cent., one-half by cold expression; dark-green, pleasant smelling; density, 0.9355 at 15°; n_D , 1.47165 at 25°; acid number, 2.00; saponification number, 190.28; iodine number, 108.34; Hehner number, 95.51; Reichert-Meissl number, 2.64; Polenske number, 0.50.

Cladium oil, from the seed of *C. mariscus*, yield (petroleum ether extraction), 5.71 per cent.; thick, green product; density, 0.9183; n_D , 1.4676; acid number, 16.2; saponification number, 192.4; Winkler iodine number, 97.7; Hehner number, 96.26; Reichert-Meissl number, 2.86; Polenske number, 0.50.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2769.

Hydnocarpus Oils.—*Use of Sodium Compound in Leprosy.*—Rogers reports that he has treated a series of cases of leprosy with a preparation from oil of *Hydnocarpus Wightiana*, consisting mainly of sodium hydnocarpate, with sufficient of the lower melting point acids to make it soluble, and also containing a little sodium chaulmoograte, as these acids are very closely related.—Indian Med. Gaz.; through Chem. and Drug., 91 (1919), 1121.

Hydrogenated Oils.—*Use in Pharmacy.*—Kyser and Mayo explain what is meant by hydrogenation in general and the methods employed in applying the principle to unsaturated oils. The authors chose coconut oil for their experiments in order to obtain a product of about the consistence of lard and having a low iodine value. Coconut oil requires very little hydrogen for saturation and has a low iodine value, and the product had a melting point only a little higher than lard and an iodine value of one. This hydrogenated product is especially good for iodine ointment since the official ointment is objectionable because of the great loss of

iodine by absorption. Substituting petrolatum yields a good ointment but reduces the absorption by the skin. Ointment bases of any consistence can be prepared with this substitute and its use in the U. S. P. ointments yield good products but their keeping qualities are still undetermined.—J. Am. Pharm. Assoc., 8 (1919), 816. (Z. M. C.)

Hydroxycholesterol.—*Properties of.*—J. Lifschütz reports that the hydrolysis of cholesterol dibromide yields in the presence of sodium acetate a mixture which is partly amorphous and partly crystalline. The amorphous substance is hydroxycholesterol. The double bond of the cholesterol which was eliminated by the bromination is thus re-established on hydrolysis. The crystalline substance, M. P. 139°–141°, is a modified cholesterol which the author calls "metacholesterol." On boiling cholesterol dibromide with alcoholic potassium hydroxide a hydroxy derivative of cholesterol is obtained which is not identical with the known hydroxycholesterol. The author proposes the name of "isohydroxycholesterol" for this substance.—Z. physiol. Chem.; through J. Soc. Chem. Ind., 38 (1919), 922A.

Linseed Oil.—*Use as Floor Stain.*—Boiled linseed oil, applied about four times over a sandpapered surface and subsequently polished with beeswax and turpentine, makes a good floor stain.—Chem. and Drug., 91 (1919), 54. (K. S. B.)

Olive Oil.—*Production in Greece.*—The anticipated production of olive oil in the island of Mitylene for 1918 is 5,000,000 okas (816 okas = tun, or 256 gals.), and the total production of the Peloponnesus is 7,000,000 okas. In Crete, 3,000 to 3,500 tuns is expected, and the crop in the district of Pelion is expected to yield about 300,000 okas.—Chem. and Drug., 91 (1919), 626. (K. S. B.)

Olive Oil.—*Production in Turkey.*—The three chief regions of production of olive oil are Gulf of Ismid, on the west coast of Asia Minor and in Syria.

The production of olive oil in Turkey amounts to 70,000 to 80,000 tons, of which 7,000 tons are exported each year.—Drug and Chem. Markets; through Pharm. J., 102 (1919), 548. (F. H.)

Olive Oil.—*Use as Laxative.*—In order that digestible oils may act as laxatives, it is necessary to give more than can be digested

and absorbed. In the case of an infant, this may be one or more teaspoonfuls daily, beginning with small dosages and increasing them until the desired effect is obtained. For adults, one or two tablespoonfuls may have to be given three times daily, either an hour before meals or two hours after meals. Olive oil may be taken mixed with hot milk or floating in fruit juice. Olive oil might be particularly serviceable in spastic constipation in an emaciated individual. The use of olive oil as a laxative would be contraindicated in obesity, diabetes, gastric atony and in hypochlorhydria, as well as in those inclined to biliousness.—J. Am. Med. Assoc., 73 (1919), 1441. (W. A. P.)

Orange Seed Oil.—S. Kobayashi reports a study of the seed of the "Sinensis," the "Fortunella" and the Junos varieties of oranges. His results are tabulated below:

Seed.	Sinensis.	Fortunella.	Junos.
H ₂ O.....	44.67	39.06	10.60
Crude fat and oil.....	19.52	25.50	21.88
N.....	1.71	1.38	2.39
Crude protein.....	10.68	8.66	14.94
Non-nitrogenous subs.....	18.70	17.25	44.63
Fiber.....	4.68	7.23	5.41
Ash.....	1.75	2.30	2.53

Oil.	Sinensis.	Fortunella.	Junos.
Color.....	pale golden yellow	brown yellowish green	golden yellow yellow
Nature.....	semi-drying	semi-drying	semi-drying
d ₁₅	0.9200	0.9223	0.9221
n _D ²⁰	1.422	1.4730	1.4720
Acid value.....	0.90	1.05	4.97
Sapon. value.....	192.7	193.4	195.1
I value (Wijs).....	105.27	113.03	100.42
Unsapon. matter.....	1.22%	1.22	1.28
Fatty acids { solid.....	27.1%	19.1%	22.2%
{ liquid.....	66.2%	74.7%	71.3%
M. p. of fatty acids.....	58.58.5°	52.52.5°	52.53°
I value { solid.....	5.82	34.23	43.71
{ liquid.....	142.85	137.29	130.54
Neutraliza- { solid.....	213.5	205.8	199.2
tion value { liquid.....	193.3	193.6	196.8

—J. Chem. Ind., Japan; through Chem. Abstracts, 13 (1919), 1125.

Palm Oil.—*Alteration of.*—Balland finds that palm oil rapidly undergoes spontaneous hydrolysis and should be used shortly after its preparation. In some cases, within a few months, 75 per cent. of the oleic acid present is found in the form of free acid.—*Compt. rend.*; through *J. pharm. chim.*, 19 (1919), 28.

Palm Oil.—*Production of.*—The Colonial Institute of Marseilles has published a detailed description of the machines which have been made for the extraction of oil from the fruits of the palm and for the crushing of kernels. A number of hand machines are given with full illustrations and also of the heavy machines suitable for factories. The first equipped factory was set up by a Frenchman at Cotonou, in 1908, but the Germans subsequently took the matter up and made the most of the system, helped by large concessions of land. It is a curious fact, however, that the hand-produced oil of Lagos is of a better quality than that produced by the machines. The publication referred to above seems to be the fullest investigation of the subject that has been made.—*J. Ind. Eng. Chem.*, 11 (1919), 590.

Palm Oil.—*Wijs Iodine Value of.*—The normal range of iodine values for palm kernel oil is 16 to 23. The average value for 574 samples of refined oil was found to be 18.1 and for 1,236 samples of crude oil 18.6. The oils worked with in this investigation were expressed from the kernels crushed in the mill under ordinary works conditions.—*J. Soc. Chem. Ind.*, 38 (1919), 128. (J. K. T.)

Peanut Oil.—N. Schlue and H. L. Maxwell report on an examination of peanut oil and give the constants of the oil as determined by the author.—*Chem. News*, 119 (1919), 185. (C. P. W.)

Perilla Oil.—This valuable oil is produced from seed of the *Perilla ocymoides*, an Asiatic mint commonly grown in Japan and Korea, whence most of the local supply of Kobe comes. Considerable quantities of seed are imported into Japan from China and the Kwantung Leased Territory in Manchuria, principally from Tientsin and Dairen. The oil is used in Japan in the manufacture of paints, paper umbrellas, and generally for the same purposes for which boiled linseed oil is used in the United States. It is claimed that it is superior to the latter for use in paints. The oil is

also used for edible purposes, for mixing with the cheapest kind of lacquer for the preparation of paper umbrellas, and artificial leather.—Pharm. Era, 52 (1919), 14.

Pine Seeds and Pine-Seed Oil.—Matthes and Rossié find that the air-dried seed of *Pinus pinca* contain 5.94 to 6.28 per cent. of water, 5.09 per cent. of nitrogen (or 31.81 per cent. protein), 5.98 per cent. of sugar (calculated as sucrose), 0.048 per cent. of lecithin phosphoric acid, mineral substances and 45.03 per cent. of oil. Moderate cold pressure of the seed gives a yield of 27.33 per cent. of oil, which is bright yellow, mobile, odorless and of pleasant flavor. Its constants are: Density, 0.9198 at 15°; solidification point, -21°; n_D , 1.4678 at 40°; optically inactive; acid number, 3.3; saponification number, 192.76; ester number, 189.46; iodine number, 124.97; Hehner number, 94.81; Reichert-Meissl number, 0.80; Polenske number, 0.6; acetyl number, 10.9; elaidin reaction, positive. The oil consists primarily of the triglycerides of palmitic, stearic, oleic and linoleic acids. Of the fatty acids, 5 per cent. are solid (stearic, 8 per cent.; palmitic, 92 per cent.) and 94.5 per cent. are liquid (oleic, 51-57 per cent.; linoleic, 43-49 per cent.). The unsaponifiable portion of the oil contained a sitosterol, melting at 136°.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1400.

Plum Kernel Oil.—Utz obtained from the kernels from plum stones 30.13 per cent. of oil with the flavor of bitter almonds. Its analytical values agreed with those given by Alpers (see YEAR BOOK, 1918, 461), viz.—Sp. gr. 0.9193-0.9213; refractometer reading at 25° 65.1 to 66.7; saponification value, 188.1-198.5; and iodine value, 103.6-121.1. Both this oil and two commercial samples gave an orange or brown coloration with Bieber's reagent, but did not show any pink coloration with Baudouin's reagent or Soltsien's stannous chloride reagent. The pink coloration obtained by Darvas (see YEAR BOOK, 1917, 385), in the Baudouin test must be attributed to accidental contamination of the oil with sesamé oil.—Chem. Umschau; through J. Soc. Chem. Ind., 38 (1919), 505A.

Po-Yoak Oil.—A sample of po-yoak oil from Sierra Leone, derived from the kernels of a species of *Parinarium*, was found, on examination, to be pale yellow in color, containing a deposit of dark-colored "stearin," and had a smell resembling that of Chinese

tung oil. Its high iodine value indicates that it belongs to the class of drying oils and could be utilized in the manufacture of paints and varnishes, though its precise value for these purposes remains to be determined. On standing for some time in a cool place the oil becomes thick and pasty. About forty years ago the kernels of *Parinarium Mobola* from Liberia were introduced on the Liverpool market as an oilseed.—Pharm. Era, 52 (1919), 72.

Rhus Glabra Oil.—*Properties of.*—H. W. Brubaker states that the berries of the common sumac (*Rhus Glabra*) contains an oil of the following average composition:

Sp. gr. 15°.....	0.92577
Refractive index, 20°.....	1.4710
Acid value.....	0.9
Acetyl value.....	9.235
Saponification No.....	192.6
Iodine value.....	126.76

The oil has a mild odor, pleasant taste and a deep yellow color. It is quite viscid at room temperature and at minus 16° is a soft solid. The oil rapidly absorbs oxygen and dries completely.

It is suggested that the oil might find use as an edible oil, in soap or in the paint industry.—J. Ind. Eng. Chem., 11 (1919), 950. (L. A. B.)

Sambucus Racemosa Oil.—Matthes and Rossié obtained by expression from the fruit of red juniper (*Sambucus racemosa*) a golden yellow, odorless oil, which darkened on standing. Its physical constants are: Density, 0.9215 at 15°; solidification point, —13°; n_D 1.4655 at 40°; optically inactive; acid number, 3.11; saponification number, 192.56; ester number, 189.45; iodine number, 116.95; Hehner number, 94.95; Reichert-Meissl number, 0.77; Polenske number, 0.75; elaidin reaction, positive. The fatty acid content is 20 per cent. solid and 74 per cent. of liquid acids. The latter being linolenic (10 per cent.), linoleic (32 per cent.), and oleic (55–58 per cent.). The oil contained 0.65 per cent. of crude phytosterol, which, when purified, melted at 136.5°.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1400.

Sesame Oil.—*Purification of Indian.*—"Til" oil is used for soap manufacture, perfumes, margarine, and as an edible oil. Experi-

ments were undertaken by Rai and Dunncliff on decolorization, deodorization, hardening and bleaching, with the following results: (1) Bone charcoal and French chalk are the best decolorizers by filtration, but they do not deodorize. (2) Sunlight bleaches progressively, but does not deodorize. (3) Treatment with air improves color, but does not deodorize. (4) Air and sunlight, combined markedly affect color, and leave the odor not unpleasant. (5) Sulphuric acid removes odor, and reduces color very slightly. (6) Caustic soda is a good decolorizing and deodorizing agent. (7) The color slowly returns to bleached samples. (8) The odor of deodorized samples is perceptible on heating, but not on cooling again.—J. Soc. Chem. Ind., 38 (1919), 99R.

Shinia Oil.—*Source and Use.*—In Cyprus, shinia oil has been experimently produced from the berries of *Pistachia lentiscus*, and has been used for edible purposes and for soap-making.—Chem. and Drug., 91 (1919), 830. (K. S. B.)

Tethelin.—*A Lipoid Body.*—This substance is of the nature of a lipid and is obtained from the anterior lobe of the pituitary body. T. Brailsford Robertson, first isolated it in 1916. According to him it is the growth-controlling principle of the anterior lobe of the pituitary body. G. E. Éwe now points out the chemical character of tethelin and explains that particular care must be used in dispensing this extremely sensitive substance. The pharmacologic action and manner of use is brought out as well as its physical characteristics. It is a white or pale cream colored substance, which powders readily and rapidly absorbs moisture from the air and darkens in color. A combination of air and moisture causes decomposition with loss of iodine-absorption power. Heat is also a factor in its decomposition. It is soluble in water to 5 per cent. This solution is faintly acid in reaction. Also soluble in ethyl alcohol, less so in ethyl ether, and soluble in chloroform and carbon tetrachloride.—Am. J. Pharm., 91 (1919), 349. (J. K. T.)

Tomato Seed Oil.—*Composition of.*—George S. Jamieson and H. S. Bailey state as the result of their investigation, that tomato seed grown in various localities in the United States, contain a fixed oil. The yield is about 25 per cent. of oil when extracted with ether and about 18 per cent. of oil when expressed. The oil was

found to have approximately the following composition: Olein—45 per cent., linolein 34.2 per cent., palmitin 12.47 per cent., stearin 5.89 per cent.; also small amounts of free acids and unsaponifiable matter. The presence of a small amount of arachidic acid was also proven. This article also gives the physical and chemical constants of a number of authentic samples of oil.—J. Ind. Eng. Chem., 11 (1919), 850. (L. A. B.)

Vegetable Tallow.—*Chinese.*—E. Nakamori states that the annual production of this fat (obtained from the seeds of *Stillingia sebifera* amounts to 21,000 tons. The author studied the physical and chemical properties of "prima vegetable tallow," "secunda vegetable tallow," and the fatty acids and obtained the following results:

	(1) prima veg. tallow.	(2) secunda v. t.
$d_{15.5}$	0.8843-0.9040	0.8928
Sapon. value.....	206.2	204
I value.....	19.37-60.76	82.20
M. p. l.....	36-47°	...
n_{60}°	1.4481-1.4518	1.4583
Acid vaue.....	4.21-14.70	1.537
	Fatty acid.	
Titer.....	53.5	43.0
Neutralization value.....	222.93	221.41
I value.....	31.10	84.27

—J. Chem. Ind., Japan; through Chem. Abstracts, 13 (1919) 1940.

Walnut Oil.—Matthes and Rossié find that *Juglans regia* by cold expression yields 44 per cent. of a greenish yellow drying oil. When walnuts are extracted with ether a 50 per cent. yield of oil, obtains and thus has a brownish color and a sharp odor and taste. The physical constants of the oil are: Density, 0.9238 at 15°; solidification point, -28° to -29°; n_D , 1.4720 at 25°; α_D , 0°; acid number, 9.87; saponification number, 192.6; ester number, 182.73; iodine number, 148.3; Hehner number, 96.02; Reichert-Meissl number, 3.19; Polenske number, 1.6; claidin reaction, positive. The oil consists of 7 per cent. of solid and 73 per cent. of liquid fatty acids; the latter being, linolenic (4 per cent.), linoleic and oleic acids (78-83 per cent.).—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1400.

CARBOHYDRATES.

Aldoses.—*Assay in Alkaline Solution.*—Colin and Liéven treat the aldose solution with about three times as much tenth-normal iodine as are needed to oxidize the aldose and then added an alkaline solution containing in each liter, 35 grammes of sodium phosphate and 50 mls of tenth-normal sodium carbonate to the liter, the amount of this solution being about twice the volume of the iodine solution employed. The mixture is allowed to stand one hour, after which it is made faintly acid with sulphuric acid and the excess of iodine is titrated with thiosulphate V. S. The article gives directions for removing protein, tannin, coloring matter and inulin prior to carrying out the assay.—Bull. Soc. Chim.; through Am. J. Pharm., 91 (1919), 313.

Dextrin.—*Examination of.*—Babington, Tingle and Watson of Ottawa, Canada, state that our incomplete knowledge of this part of carbohydrate chemistry has caused the name starch to have a wider and more vague meaning than formerly, so they define it in the sense in which they use it in their investigation. Analytically they regard as starch the carbohydrate or group of carbohydrates, which, whether soluble in cold water or not, form a solution or gelatinize with hot water, or give a blue color on treatment with iodine, and are precipitated by semi-saturation of the cold solution with barium hydroxide. Dextrin they deem a mixture which results from the hydrolysis of starch when the change has not been carried so far as a complete conversion into sugars, though the latter may be present in the gum. Dextrin gives no blue color with iodine and is soluble in both cold and hot water, and in a cold half-saturated solution of barium hydroxide. Their method is applicable to mixtures of starch and gum arabic, such as sometimes met with commercially.—Am. J. Pharm., 91 (1919), 50. (J. K. T.)

Fluoridose.—*A New Sugar.*—By hydrolysis of the mucilage found in an aqueous decoction of certain algæ, such as *Chondrus elatus*, *Ahnfeltia plicata* and *Iridaea laminarioides*. H. Takahashi obtained fluoridose, in the form of rectangular crystals, melting at 152 to 153° and possessing the optical rotation, $\alpha_D = 80.75^\circ$. This sugar is an aldohexose, strongly reducing Fehling's solution and easily fermentable with yeast. From it, Takahashi prepared a

hydrazone melting at 158 to 160° and osazone melting at 193°, a hexatomic alcohol, *floridite*, melting at 186 to 187°. While the new sugar resembles galactose and its alcohol resembles dulcitol, it is different from both in a number of ways.—J. Tokyo Chem. Soc.; through J. pharm. chim., 20 (1919), 357.

Glucose.—*Use in Bacterial Infections.*—The fact that all pathogenic bacteria are capable of fermenting glucose, and thereby producing a definite acidity of the medium, which distinctly inhibits the production of bacterial toxic bodies, and further, that the presence of a small amount of glucose prevents the formation of indol by bacteria, induced Benians to apply a 25 per cent. solution of glycose in bromidrosis, ozena, chronic otorrhea, and chronic vaginal discharge. In the latter indication, treatment consisted in douching twice daily with a 25 per cent. solution of liquid glucose in warm water, or in the introduction nightly of a glucose pessary, 25 per cent., made up in a gelatin basis.—Brit. Med. J.; through Chem. and Drug., 91 (1919), 270.

Glucose and Levulose.—*Utilization by the Higher Plants.*—H. Colin points out that the composition of the reducing sugar in the beetroot leaf differs in the lamina and the petiole. The ratio of dextrose to levulose, often less than one in the leaf parenchyma, increases all along the medial vein and through the petiole. The same phenomenon is observed in chicory leaves and in most leaves with a fleshy petiole, which do not contain any carbohydrate except crystallizable sugar and the products of its hydrolysis; glucose is present in excess over levulose in tissues which contain no chlorophyll. The etiolated leaves of beetroot, grown in absence of light, showed an excess of glucose, and also the subterranean parts of Jerusalem artichoke and the colorless leaves of chicory. It is simplest to suppose that the dextrose and levulose migrate with unequal velocities and are utilized at unequal rates. The concentration of the hexoses in the cells is too low to allow of any appreciable difference in the viscosities, and consequently in the rates of diffusion. In these cases the dextrose is consumed less rapidly than the levulose by the cells, and it is convenient to adopt the hypothesis of Brown and Morris according to which glucose undergoes combustion in the cell in preference to levulose, which goes to build up the tissues. It is known that respiration is less energetic

in the petiole than in the lamina and in etiolated than in green leaves.—*Compt. rend.*; through *Chem. News*, 118 (1919), 240.

Mannose.—*Fermentation of.*—A series of experiments on the fermentation of saccharified extracts of vegetable ivory, were conducted by G. Mezzadrolì. The author experimented with different kinds of yeasts, and found a variety obtained from Apulla, Italy, best suited for the purpose. Yields of alcohol, ranging from 1.75 to 6.85 per cent. were obtained from solutions of mannose from 3 per cent. to 12 per cent. concentration. A small quantity of ammonium phosphate facilitated the fermentation materially. This variety of yeast ferments dextrose, sorbose, sucrose and maltose readily, but loses much of its power with lactose, raffinose and inulin. Complete fermentation obtained with saccharine extracts of beets, maize, sugar cane, figs, locust beans and others. The yeast grows well on agar containing malt wort, and on faintly alkaline glucose-agar.—*Chem. Zent.*, 90 (1919), 506. (G. C. D.)

Nitrocellulose.—*Behavior with Pyridine.*—Nitrocellulose gelatinizes with small quantities of pyridine, while with larger quantities a brown solution that passes through a filter paper is obtained. When such a solution is treated with water, there is precipitated a white resinous substance retaining a considerable amount of pyridine. When the latter is removed by treatment with alcohol and diluted sulphuric acid, there is left an amorphous white powder soluble in acetone and alcohol, insoluble in ether and benzin, containing 9 to 10 per cent. of nitrogen. Yield, about 80 per cent. of the original nitrocelluloid. The substance becomes brown on heating to 165° and turns black at 250°. On mixing its alcoholic solution with water a colloidal opalescent fluid is obtained, from which coagulates on addition of sodium chloride, ammonium sulphate or gelatin.—*Atti. Acad. Lincei*; through *J. pharm. chim.*, 20 (1919), 284.

Paper.—*Production from Dead Leaves.*—K. Bramson calculates that the amount of dead leaves in France annually is about 35 to 40 million tons and that they might well be utilized. From the venation good paper can easily be prepared, while the protoplasm can be used for feeding purposes, as fuel, or be subjected to destructive distillation for the production of acetic acid, acetone, etc.—*Compt. rend.*; through *Pharm. Weekblad*, 56 (1919), 660. (H. E.)

Rhamnose.—*Preparation of.*—E. P. Clark describes the preparation of rhamnose from commercial quercitron extract. The yield is 50–55 grammes of the pure sugar from $2\frac{1}{2}$ kilos. of extract.—J. Biol. Chem.; through J. Soc. Chem. Ind., 38 (1919), 593A.

Starch.—*Preparation of Soluble.*—Soluble starch can be prepared by enzymic action, hydrolysis with acids or hydrolysis with superheated steam. In all these methods if definite working conditions are not maintained, hydrolysis beyond the formation of soluble starch takes place, especially when boiled starch is subjected to the action of enzymes, by which very rapid conversion of the starch into end products other than hydrolytic products of starch are produced. Lintner's method, which has been regarded as a reliable process for making soluble starch, furnishes a product which is strongly contaminated with amylopectin, erythropectin and other copper-reducing substances. This process is as follows: Raw starch is digested at room temperature with 7.5 per cent. hydrochloric acid for seven days, stirring the mixture several times every day. The acid liquid is decanted, the starch washed with water until practically free from acid and then dried. Small found that a much purer soluble starch free from copper-reducing substances can be obtained by boiling the starch with 95 per cent. alcohol containing 0.75 per cent. by volume of strong hydrochloric acid on a water-bath for ten minutes. The acid solution is then neutralized with sodium bicarbonate, the alcohol decanted, etc.—J. Am. Chem. Soc.; through Drug. Circ., 63 (1919), 329.

Starch.—*Preparation of Solution of.*—While ordinary starch solutions are sufficiently sensitive as an indicator in titrations with N 10 iodine solution, the color change is not sharp enough when N 500 or N 2000 iodine solutions are used, as in the case of estimating arsenic in forensic analysis. A starch solution suitable for the latter purpose is prepared, according to Ericsson by the following process: 5 grammes of starch are shaken in a flask with 100 mls of water, the mixture is heated on a water bath for 10 minutes at 80° and allowed to stand over night. It is then filtered and 50 mls of the milky filtrate are heated with 5 mls of normal potassium hydroxide solution until a perfectly clear liquid is obtained. A yellow coloration produced during the heating process disappears on cooling. The solution is stable. Since potassium hydroxide absorbs iodine, the liquid to be titrated should be rendered slightly

acid with hydrochloric acid before adding the iodine solution.—Svensk. Farm. Tid.; through Drug. Circ., 63 (1919), 552.

Starch.—*Production from Horse-Chestnuts.*—F. Wischo gives a method by means of which he claims starch, entirely free from saponins, and meeting all pharmaceutical requirements, can be obtained. His method is as follows:

The freshly-collected horse-chestnuts are carefully peeled, sliced through the center and the embryo removed, and ground in a proper mill to a fine powder. The powder is then placed in a capacious vessel and covered well with water, and is allowed to stand for at least 12 hours, stirring frequently. The mixture is then strained and the residue on the strainer washed repeatedly with water. The liquid after standing for a time, deposits starch granules in the form of a white, sticky mass. The supernatant liquid contains a considerable quantity of saponins, and may be utilized for cleansing purposes. The deposited starch is washed with water until the supernatant liquid remains clear and until all bitter taste is removed. It is suggested the residue can be utilized as fodder. The yield of starch is about 6.50 per cent.—Chem. Zent., 90 (1919), 46. (G. C. D.)

MACERATION before or after fermentation, or after treatment with sodium carbonate solution, presented mechanical difficulties in the separation of starch from horse-chestnuts, but the following method was found to be practicable by A. Heiduschka: The air-dried meal (containing about 91 per cent. of dry substance) is made into a paste with 1 per cent. sodium sulphite solution and, after an hour or so, the paste is mixed with water, and the starch washed through a fine sieve. The yield is about 40 per cent. of starch. The wash-water contains dextrins, dextrose, proteins, oils, etc., and may be utilized in the distillery, or mixed with the insoluble portion of the chestnuts, or with other foodstuffs, and used as a fodder.—Pharm. Zent.; through J. Soc. Chem. Ind., 38 (1919), 49A.

Starch.—*Reaction with Formalin.*—Von Kaufmann and Lewite combat Woker's claim that starch is hydrolyzed by formalin, and that on this account the iodine reaction is negative. The authors show that it is possible to recover the starch quantitatively from formalin solutions, in an unchanged condition. They explain

the negative iodine reaction by stating that the starch is possibly in chemical combination with the formaldehyde, or that it may be considered in the nature of a colloid chemical condition.—Ber., 52 (1919), 616. (G. C. D.)

Starch.—*Stabilizing Solutions with Metallic Mercury.*—A. Junk found that in starch solutions boiled for a short time with metallic mercury or in oxalic acid solutions shaken well for some time with the metal, the growth of bacteria is inhibited.—Chem. Ztg.; through Pharm. Weekbl., 56 (1919), 1424. (H. E.)

Sucrose.—*Use in Intravenous Injections of Irritating Substances.*—G. Rosenthal finds that intravenous injections of 2 milligrammes of gold cyanide in 5 mls of concentrated sucrose solution were well tolerated. Little or no inhibiting effect was noted when quinine or mercuric cyanide was injected intravenously in sucrose solution; hence sucrose solution is recommended as the proper fluid for such intravenous injections.—Compt. rend. Soc. Biolog.; through Chem. Abstracts, 13 (1919), 498.

Sugar and Glucose.—*British Imports.*—The imports of sugar and glucose into the United Kingdom during 1918 were as follows:

	Cwt.
Refined.....	431,027
Unrefined—	
Beet.....	153,836
Cane and other sorts.....	25,528,146
Total of sugar.....	26,113,009
Glucose—	
Solid.....	208,038
Liquid.....	169,583

—Chem. and Drug., 91 (1919), 861. (K. S. B.)

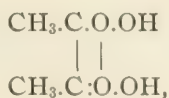
Sugar.—*Production of Calcium Saccharate Injections from.*—Hypodermic or intra-muscular injections of calcium salts give better results in the treatment of the various affections which cause decalcification than simple ingestion. Saccharated solution of lime is the most satisfactory form for administering the metal in this way. The solution successfully employed by R. Dubois consists of lime, 9 grammes; sugar, 30 grammes; water, 100 mls.

The lime is slaked; the calcium hydroxide obtained is suspended in the water; the sugar is added; and after occasional agitation the liquid is filtered and sterilized. In order to render the injection more readily tolerated, the alkalinity may be neutralized.—*L'Union pharm.*; through *Pharm. J.*, 103 (1919), 296.

ORGANIC ACIDS.

Organic Tellurium Salts.—*Preparation of.*—Aaron M. Hageman finding it was necessary to secure solutions of tellurium in a number of non-aqueous solvents conducted an investigation of certain organic salts of tellurium based upon the fact that in many cases combinations of a metal with an organic acid radical are more likely to be dissolved by organic liquids than in organic salts. Although tellurium dioxide is chiefly acid in character there are numerous cases where it shows specific basic tendencies. This suggested a general method for the preparation of organic salts of tellurium, namely, the treatment of tellurium dioxide with the free organic acid. In some cases this proved to be a satisfactory method of preparation, while in numerous other cases a chemical union could not be brought about by this means. This was especially true where the acid character of the organic acid was unusually weak.—*J. Am. Chem. Soc.*, 41 (1919), 342. (J. L. M.)

Acetic Acid.—*Constitution of.*—J. C. Thomlinson points out that the vapor of acetic acid at 135° has a density of 3.01; at 300° it is 2.08. The most natural assumption, one that is borne out by facts, is that at the lower temperature 50 per cent. of the vapor has a molecular formula—



the density at 300° corresponding to CH_3COOH . The specific heat of acetic acid vapor taken as 0.4 would indicate an absorption per gramme molecule of $0.4 \times 165 \times 60$; *i. e.*, 3.960 cal. through the range of temperature in which this change takes place, and corroborates conclusions drawn for a carbon atom changing from a single to a double linking as in the simpler formula $\text{CH}_3\text{C} \begin{array}{l} \diagup \text{O} \\ \diagdown \text{OH} \end{array}$.

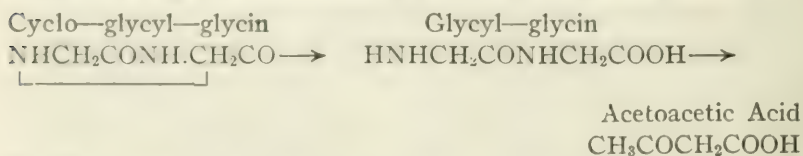
These conclusions, drawn from a comparison of heats of formation, justify the above formula, as does the specific heat. The double formula lending itself to a possibility of stereo-isomerism there

may be quoted a divergence in the determinations of the boiling-point, the slight alkalinity of the normal sodium salt, whilst the calcium salt is neutral, and hence slight difference in titrating with caustic soda or lime-water. Also acetic acid of the maximum density takes place with a union of 67.7 parts of acid and 18 of water; with a hydrate, $C_2H_4O_2 \cdot H_2O$, it would be in the ratio 60 : 18, and isomers might dissociate variably. Acetic anhydride has a density almost identical with the maximum for acetic acid, hence the possible persistence of the double structure of acetic anhydride, $CH_3 - CO > O$, in the molecule of acetic acid.—Chem. News, 118 (1919), 23.

Acetic Acid.—*Detection of Formic Acid.*—When bromine is added to formic acid, carbonic acid and hydrobromic acid are formed, according to the equation: $HCOOH + Br_2 = CO_2 + 2HBr$. This reaction has been utilized by Bayer for detecting formic acid in acetic acid. To a solution of 2 to 3 grammes of sodium acetate in 10 mls of water, bromine water is added until a yellow color is produced and then 1 to 2 mls of the acetic acid under examination. If as little as 0.1 per cent. of formic acid is present, the yellow color disappears; if formic acid is absent the color is intensified.—Pharm. Post; through Drug Circ., 63 (1919), 283.

Acetoacetic Acid.—*Origin in the Organism.*—While it has been commonly supposed that the formation of acetoacetic acid in the organism was due to the oxidation of albuminoids and fats, L. C. Maillard reports that a sample of the mother liquor of cyclo-glycyl-glycine suddenly developed the odor of acetoacetic acid and the presence of this substance was proven by the usual tests. A microscopic study of the fluid showed the presence of only yeast cells.

From this phenomenon, the author is led to the belief that acetoacetic acid in the organism is produced by the reduction of simple dipeptides with the elimination of ammonia, as shown below:



—Bull. Acad. Med.; through J. pharm. chim., 20(1919), 185.

Acetylsalicylic Acid.—*Quality of Commercial Samples.*—Out of 11 samples of this chemical examined by J. H. Ramsay only three came up to the standard of the British Pharmacopœia as to free salicylic acid. Conditions in the case of tablets were even worse.—*Chem. and Drug.*, 91 (1919), 1511.

Acetylsalicylic Acid.—*Assay of.*—L. T. Andrews and Chas. S. Herron, finding that the method of assay of acetylsalicylic acid used by Allen gave repeated unsatisfactory results, suggest this method: Place exactly 1 gramme of acetylsalicylic acid in a 250-mil flask, dissolve by adding 25 mls neutral alcohol, titrate to a light pink with half-normal alcoholic potassium hydroxide, using phenolphthalein as indicator; the amount required of N/2 alcoholic potassium hydroxide, they call "A." Then run in enough half normal alcoholic potassium hydroxide to make exactly 30 mls; heat on water-bath 30 minutes to complete saponification, add 100 mls of distilled water; titrate back with half normal sulphuric acid; this amount they call "B."

$$30 - (A + B) \times 0.09003 \times 100 = \text{Percentage purity.}$$

This method, though identical in principle to the Allen method, by the use of N/2 alcoholic potassium hydroxide, gets rid of any possibility of hydrolysis with consequent poor results. At the same time Andrews and Herron observed that many samples of acetylsalicylic acid examined, assayed 99.9 per cent. of acetylsalicylic acid and had melting points of 139° C., whereas there were few samples of acetylsalicylic acid which met official requirement as to melting point (133–135°), since that of 133–135° is incorrect for acetylsalicylic acid free from uncombined salicylic acid. To prove their conclusion they examined the samples having high melting point, for free salicylic acid.—*Am. Drug.*, 67 (1919), 85. (M. D.)

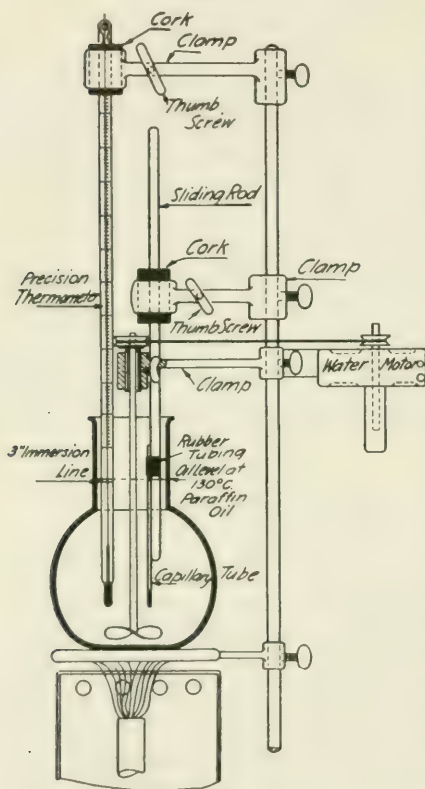
Acetylsalicylic Acid.—*Notes on.*—An apparatus is illustrated and described in this article by Henry L. Dahm, for accurately determining the melting point of bodies which ordinarily decompose during the period of heating if too long continued.

Using this apparatus, samples of American and foreign manufactured aspirin were found to melt within the range of 133–135° C. (corrected).

Free salicylic acid in acetylsalicylic acid is estimated by comparison of the color produced by treating 5 mls of 2 per cent. solution of acetylsalicylic in alcohol, diluted with 20 mls of water

and treated with 1 drop ferric chloride solution with a set of color standards made by diluting a solution of crystallized cobalt chloride acidulated with hydrochloric acid according to a table given in the original paper.—*J. Ind. Eng. Chem.*, 11 (1919), 29. (L. A. B.)

Fig. 31.



Melting-Point Apparatus.

common name for acetylsalicylic acid, no one firm can have an exclusive right to it.—*J. Am. Med. Assoc.*, 72 (1919), 119. (W. A. P.)

Aspirin and Aspirin Tablets.—*Purity of.*—The purity of various samples of aspirin and aspirin tablets was investigated by A. J. Jones. He determined the acid figure by titration in alcoholic solution, then the ester figure by hydrolysis and back-titration. Theoretically these should be identical, but should the former be in excess, due to hydrolysis, he suggests limiting the excess to 0.3

Aspirin.—As a *Common Name.*—The claim of the Bayer Company to the exclusive right of applying the name "aspirin" to acetylsalicylic acid will be definitely set aside if the recommendation of the examiner of interferences of the United States patent office is upheld. The stand taken by the patent office is in line with the established principle that no one can have a monopoly in the name of anything. Since "aspirin" has become the

mils N/5 sodium hydroxide per gramme of aspirin. Under the same conditions the bromine figure should not exceed the acid figure by more than 0.15 mil. He determined the bromine figure by liberating bromine in the solution, after hydrolysis with sodium hydroxide and estimating the residual bromine by titrating the iodine which is liberated upon the addition of sodium iodide. The bromine taken by one gramme of aspirin is expressed in N/5 mils divided by 6 to reduce it to a monobasic reaction, in which case it should be exactly equal to the acid and ester figures. Other causes of an excess of the acid figure over the ester figure are the presence of free salicylic acid or of salicyl-acetic acid, which has two carboxyl groups and so would increase the acid figure as compared to both the ester and bromine figures. Jones estimates free salicylic acid by preparing solutions containing 0.2 gramme and 0.4 gramme, respectively, of aspirin in an alcohol and water mixture, and adding a solution of iron alum. A standard solution (1 mil = 0.0001 Gm.) of salicylic acid is added to the weaker solutions of aspirin until the colors match. The amount of salicylic acid so added is the amount present, free, in 0.2 gramme of aspirin. A limit of 0.15 per cent. of such free acid is suggested. It is mentioned that the presence of alcohol represses this color reaction somewhat, also that ferric chloride does not give so good a color as iron alum. When dissolved in a mixture of 5 mils of alcohol with 20 mils of water, 0.1 gramme of aspirin containing 0.15 per cent. salicylic acid gave only a brownish yellow color; containing 0.2 per cent., a faint pink; and containing 0.3 per cent., a good salicylic acid reaction with ferric chloride. An excess of the ester figure over the acid figure might be caused by the presence of acetyl-salicyl-salicylic acid, and a limit of 0.3 mil N/5 sodium hydroxide, with the bromine figure not in excess of the ester figure, is suggested. The bromine figure would be increased by the presence of salicyl-salicylic acid or acetyl-salicyl-salicylic acid. It is stated that a good sample should be odorless either wet or dry, and show only a very pale straw color when dissolved in 10 or 20 per cent. soda solution. The melting point should not be below 136°. In working with tablets, the presence of stearic acid, wax, fatty substances, talc, etc., require some precautions. The determination of free salicylic acid by iron and the total by bromine is recommended. Crushing the tablets with alcohol, adding water, filtering through a Gooch, and using an aliquot portion is advised. —Chem. and Drug., 91 (1919), 402. (K. S. B.)

Argols.—*South African Exports.*—The exports of argols from the Union of South Africa, practically all of which was sent to the United Kingdom, amounted to 588,194 lbs. in 1918, against 656,952 lbs. in 1917.—Chem. and Drug., 91 (1919), 627. (K. S. B.)

Mercuric Benzoate.—Experiments made by R. W. Terry disclose the fact that the mercuric benzoate of commerce is not a definite substance, but consists of at least two substances, the true mercuric benzoate soluble in a solution of sodium chloride and another substance either a by-product of the reaction or a by-product due to impurities in the mother substances. A solution of mercuric chloride and sodium benzoate was filtered and evaporated to dryness on a water-bath in an attempt to prepare a water-soluble mercuric benzoate that would not need to be filtered. The product apparently was charred and was insoluble in water. Another portion was evaporated in an air oven at 40 degrees; this was pure white and slowly but completely soluble in water, containing 79 per cent. of mercuric benzoate and 21 per cent. of sodium chloride. Terry studied the problem as to whether a mixture of solutions of mercuric chloride and sodium benzoate would not be identical with a mixture of solutions of mercuric benzoate and sodium chloride and all of his experiments pointed to this conclusion. He therefore suggests that a stock solution of "mercuric benzoate" be made as follows:

Mercuric Chloride.....	2.715 grammes
Sodium Benzoate.....	2.880 grammes
Distilled Water to make.....	442.00 mils

Let stand for one week and filter. This solution will then represent 1 per cent. w-v of mercuric benzoate—mol. wt. 442.68.

A peculiar thing was noted upon adding mercuric benzoate to a solution of sodium chloride, that is, it "skates" around on the water just like metallic sodium; this is due to the change of surface tension due to the dissolving substance.—Midland Drug., 53 (1919), 222. (A. G. B.)

Mercuric Benzoate.—*Incompatibility with Sodium Chloride.*—Gaucher and other Continental physicians have prescribed mercuric benzoate dissolved in dilute sodium chloride solution for administration by hypodermic injection for the treatment of syphilis. At a recent meeting of the Academie de Médecine, E. Seger pointed out that such a combination was incompatible, and that mercuric chloride and sodium benzoate resulted from the double decomposi-

tion of these salts. M. Delépine fully confirms this. He prepared two solutions, one with mercuric benzoate and sodium chloride, according to Gaucher's formula; the other with equivalent quantities of mercuric chloride, sodium benzoate, and sodium chloride. The ultimate composition of the two products was identical. On shaking out with ether, that solvent contained the same amount of mercuric chloride in each case. This proves that the original formula of Gaucher is defective, and that nothing is gained by the use of mercuric benzoate, to immediately decompose it into mercuric chloride. If ammonium benzoate is used instead of sodium chloride in the solution with mercuric benzoate and some ammonia, the result is different. A crystalline double salt is formed, which might possibly be of service therapeutically. Ultimately, however, even this compound is likely to be decomposed into mercuric chloride when it comes into contact with the sodium chloride present in the body.—Rep. Pharm.; through Pharm. J., 103 (1919), 13.

Cacodyl Compounds.—*Assay of Arsenic in.*—L. C. Maillard takes a suitable weight of the cacodyl compound, in a sealed bulb if liquid or in a narrow tube if solid, and introduces it into a 150-ml flask containing 3 grammes of ammonium persulphate, 30 mls of water, and 10 mls of sulphuric acid. The flask is quickly closed with a ground-in stopper and thoroughly shaken, until the air in the flask, which becomes cloudy at first, is quite clear. The arsenic is now in the form of cacodylic acid and is subsequently oxidized to arsenic acid by means of nitric acid and precipitated as magnesium ammonium arsenate, either with or without an intermediate precipitation as arsenic sulphide. The method was applied to cacodyl chloride and found to be quite accurate and preferable to the usual dry oxidation method.—Bull. soc. chim.; through J. Soc. Chem. Ind., 38 (1919), 388A.

Sodium Cacodylate.—*Use of Large Doses of.*—Dr. H. Marechal, discussing the large doses of sodium cacodylate that can be safely administered, points out that he has given by intravenous injection, 4, 5 and even 6 grammes per dose without the slightest trouble to the patient. In each case, however, he begins with 0.5 gramme dose and does not begin doses larger than 1 gramme until after five days.

While he does not find sodium cacodylate of great value in syphilis he uses it with highly satisfactory results in psoriasis, and in paludism.—J. pharm. chim., 20 (1919), 259.

Citric Acid.—*Production by Fermentation.*—M. Molliard finds that saccharose can be broken up into oxalic acid and citric acid when mixed with extracts of the mushroom, *Sterigmatocystis nigra*.—Compt. rend.; through J. pharm. chim., 19 (1919), 317.

Citric Acid.—*Test in the Presence of Other Organic Acids.*—When potassium acetate is added to a solution of citric acid and tartaric acid in 60 per cent. alcohol, potassium bitartrate is precipitated, while potassium citrate remains in solution. When this solution is shaken with finely powdered barium acetate, barium citrate separates as an amorphous powder which is easily soluble in water but which on standing for several days is converted into the crystalline salt $(C_3H_4(OH)(COO)_3)_2Ba_3 \cdot 3\frac{1}{2}H_2O$. Barium citrate is oxidized by potassium permanganate to acetone which can easily be detected by the iodoform reaction. T. C. N. Broeksmit applied this reaction for the detection of citric acid in the juices of currants, lemons, raspberries, in tamarinds, in milk, in caffeine citrate, magnesium citrate, iron and quinine citrate, citrophen, etc., and obtained very satisfactory results. For detecting citric acid in the presence of malic acid (see YEAR BOOK, 1917, 404), Broeksmit gives the following method. The aqueous solution of the acids is shaken with finely powdered barium acetate and then sufficient alcohol is added to produce a permanent turbidity. The mixture is allowed to stand for several days and the precipitate is viewed under a microscope, when the crystalline barium citrate can easily be distinguished from the amorphous barium malate. The precipitate may also be triturated with a mixture of seven volumes of water and three volumes of alcohol, by which barium malate is dissolved, while barium citrate remains undissolved and can be identified by the acetone reaction. When the organic acids are present in the form of their salts, the solution is first acidified with sulphuric acid before being mixed with potassium acetate.—Pharm. Weekblad, 56 (1919), 1047. (H. E.)

Sodium Citrate.—*Use as a Cleansing Agent.*—Sodium citrate has been shown to possess valuable anticoagulant and cleansing properties, as shown by Chantemesse, and has been used by Wright in the treatment of war wounds. G. Rosenthal points out that it may be usefully employed in a great number of forms. Although it is not itself a germicide, it may be combined with advantage with a number of bactericidal drugs. By removing incrustations

and secretions it enables the latter to come into more direct contact with the infected area. A simple isotonic solution to prevent the formation of false membranes may be obtained with sodium citrate, 3 grammes; water to 1 liter. Or sodium chloride, 7.5 grammes; sodium citrate, 6 grammes; water to 1 liter, may be used. It may be added to Dakin's solution in the proportion of 10 grammes to 1 liter. Resorcinol, 1 to 10 grammes, may be used in a 1 or 2 : 100 solution of the salt. Formaldehyde solution may be similarly employed in any desired strength. It affords a useful addition to gargles, collutories, paints, and liquids for washing mucous surfaces, and also combined with ointments for treating the nasal fossæ. Combined with Peruvian balsam, with yellow mercuric oxide and Gomenol, and a number of other antiseptics, it may be incorporated in ointments with a vaseline basis. Wherever micro-organisms develop under the protection of a false membrane, sodium citrate will clear the way for the action of antiseptics.—Med. Press; through Pharm. J., 103 (1919), 537.

Calcium Creosotate.—*Preparation and Properties of.*—R. W. Terry has prepared this substance by several different methods and concludes that it is a mixture of calcium cresolate and calcium guaiacolate in about the proportion of one part of the former to three of the latter; this, of course, depending upon the percentages of these constituents in the creosote used in its manufacture. It will contain not only calcium orthocresolate, but also the meta and para varieties. Theoretically, it should contain 55.6 per cent. of creosote based upon the above proportion of cresol and guaiacol. Analyses of several samples agree very closely with these figures.

Calcium cresolate is a white, dry, bulky powder having a suggestive odor of creosote and a sharp, somewhat aromatic taste. It is stable in dry air, but slowly decomposes in moist air and in the presence of carbon dioxide forming various colored products. It is slowly soluble in 0.3 per cent. hydrochloric acid, which liberates the creosote in globules.

The administration of this substance in capsules would appear to be an ideal method of administering creosote; especially since calcium is a synergist of creosote in all its indications.—Midland Drug., 53 (1919), 132. (A. G. B.)

Cresylic Acid.—*Toxicity of.*—Annie Homer finds that when saline solutions of cresylic acid have the hydrogen-ion concentra-

tion of 6 to 6.7, they have no effect on mice or guinea pigs, but when $p_H + 8.3$, the results may be fatal. This suggests care in the use of tricresol as a serum antiseptic.—J. Physiol.; through Chem. Abstracts, 13 (1919), 977.

Ferrocyanides and Ferricyanides.—*Iodometric Assay of.*—I. M. Kolthoff reports that potassium ferricyanide can easily be titrated iodometrically and, therefore, recommends this chemical for standardizing thiosulphate solutions. Potassium ferrocyanide is determined by diluting the solution with water, heating the mixture to 40° , adding an excess of volumetric iodine solution and titrating back the excess of iodine with sodium thiosulphate solution, using starch solution as indicator towards the end of the titration.—Pharm. Weekblad, 56 (1919), 1618. (H. E.)

Formic Acid.—*Considered as an Aldehyde.*—M. Prud'homme discusses formic acid from the physical standpoint and concludes that its reducing and condensation properties justify its consideration as an aldehyde or even as an aldehyde alcohol.—J. chim. phys.; through Chem. Abstracts, 13 (1919), 1843.

Formic Acid.—*Detection of.*—In 1904 E. Commanducci found that when formic acid is heated with a concentrated solution of sodium bisulphite, an orange-red color is produced. Since this reaction cannot be applied to colored solutions, the author modified the test as follows: The solution under examination is heated with sodium bisulphite until gas bubbles are formed. The mixture is allowed to cool and a diluted solution of sodium nitroprusside is added, when in the presence of formic acid a green or blue color is produced with the evolution of hydrocyanic acid gas. The reaction is still more sensitive when the liquid is overlaid with the nitroprusside solution, by which a green ring is formed at the zone of contact of the liquids. The green color soon changes to blue and gradually a green precipitate consisting of $\text{Na}_4\text{Fe}_2(\text{CN})_9$ is formed.—Boll. chim. farm.; through Pharm. Weekblad, 56 (1919), 68. (H. E.)

Formic Acid.—*Occurrence in Nettles.*—It is commonly stated in textbooks that formic acid occurs in the stinging hairs of the common nettle (*Urtica dioica*), but there is no satisfactory proof of the statement. When nettles are cut up and distilled with water the reactions for formic acid in the distillate are obtained, but it is

now known that various parts of plants yield formic acid when treated in this way, therefore, it is not certain that the formic acid comes from the stinging hairs of the nettles; it may be derived from the general plant tissues. One of the chief chemical reactions of formic acid is its power of reducing salts of silver and mercury, but that is not necessarily conclusive proof in this case. L. Dobbin appears to have settled the point definitely. By pressing the leaves of growing nettles between dry filter papers impregnated with barium carbonate the contents of the hairs are absorbed without contamination by juices from any other part of the plant. On appropriate treatment the product yielded barium and lead salts, which were crystalline on glass slides, and the two formates were identified under the microscope. Another question is whether or not formic acid is the main cause of the intense irritation produced by nettle stings; the active irritant is regarded by one investigator as being probably due to an enzyme and not to formic acid.—Proc. Roy. Soc. Edin.; through Pharm. J., 103 (1919), 321.

Calcium Glycerophosphate.—*Solubility of.*—The solubility of calcium glycerophosphate is decreased by alcohol and glycerin. It is only about half as soluble in 12 per cent. alcohol as in water. Lactic, citric and phosphoric acids, and sodium citrate increase its solubility, but promote its decomposition. On the other hand, alcohol and glycerin tend to stabilize it. Glycerophosphates promote the change of quinine, in solution, to quinotoxin.—Bull. Pharm.; through Am. Drug., 67 (1919), 127.

Calcium Glycerophosphate.—*Official Test for Sulphates in.*—J. W. E. Harrison believes the present U. S. P. test for sulphates in calcium glycerophosphate should be made more stringent by lengthening the time period or adding more of the salt to the test. The present U. S. P. test only responds in the presence of 3.1 per cent. or over of sulphate as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. Of six samples of calcium glycerophosphate made by different manufacturers, three complied with the U. S. P. limit for sulphates but all showed presence of sulphate to such an extent that there is room for much improvement in the manufacture of this salt.—Proc. Penna. Pharm. Assoc., 42 (1919), 272. (R. P. F.)

Hydrocyanic Acid.—*Distribution in Plants.*—L. Rosenthaler gives a historical review and tabulated list of plants containing

hydrocyanic acid, along with bibliographical references. The list gives 360 species of 148 genera and 41 families. Rosaceæ have 80+, Gramineæ 40+, Araceæ 31, Passifloraceæ 26, Leguminosæ 21, Ranunculaceæ 12, Euphorbiaceæ 12 and Flacourtiaceæ 12 species containing hydrocyanic acid.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2415.

Hydrocyanic Acid.—*Sodium Thiosulphate as Antidote.*—E. Teichmann and W. Nagel found in sodium thiosulphate an efficient antidote in cases of poisoning by hydrocyanic acid gas. It can also be used as a prophylactic in persons engaged in disinfecting rooms or in destroying vermin. The exact dose has not been established as yet.—Biochem. Zeitschr.; through Pharm. Weekblad, 56 (1919), 1483. (H. E.)

Hydrocyanic Acid.—*Tests for.*—Chelle discusses the phthaleinic, the isopurpuric, the silver iodide and the Prussian blue tests for cyanides making only minor modifications in the usual methods. Jennesseaux improves the Lassaigne reaction by adding successively in a test-tube 1 mil of 5 per cent. solution of copper sulphate, enough sodium bisulphite solution to change the color to green, and then 1 mil of the cyanide solution. Thus performed the reaction is 30 times more sensitive than is the original Lassaigne reaction, detecting in 1 mil of liquid even as little as 0.00000135 gramme of HCN.—Bull. soc. pharm. Bordeaux; through J. pharm. chim., 19 (1919), 361.

Graphitic Acid.—By graphitic acid, Kohlschütter and Haenni mean the solid oxidation products which are obtained by subjecting pure graphite, prepared electrically, to the action of a mixture of nitric acid, sulphuric acid, and chlorate. It is essential that the oxidizing mixture should be taken up by the whole mass of graphite, and that the chemical action should take place simultaneously from the interior. This is brought about by the nitric acid; oxidizing agents which do not penetrate into the substance lead only to the simplest oxidation products. When the oxidizing action is repeated the proportion of carbon in the product is gradually decreased, and the flakes of graphitic acid dissolve to form reversible colloid products. When dry graphitic acid is heated to 200° carbon separates, water, CO and CO₂ being simultaneously formed. The carbon thus obtained possesses all the properties of soot, but it

can comparatively easily be compressed to give a dense mass of a graphitic nature. Sulphuric acid also decomposes graphitic acid at 160–180°, giving CO and CO₂ in proportions which depend upon the way it is heated. Reducing liquids produce carbonaceous products resembling the original graphite, mixed with by-products of the reaction. The experimental results seem to show that there is no essential difference between amorphous carbon and graphite, and the peculiar properties of the latter are due to a peculiar state of division and dispersion.—Z. anorg. Chem.; through Chem. News, 118 (1919), 263.

Lactic Acid.—*Action on Bacterial Growth.*—Effie L. Macdonald reports on the inhibitory action of lactic acid on certain bacteria and fungi. In the majority of cases—twenty-four out of thirty-one organisms—growth was inhibited with less than 1 per cent. of lactic acid. The following percentages show the effect on some of the commoner organisms: *B. diphtheria*, inhibited by 0.1 per cent. acid; *B. typhosus*, 0.2; *B. paratyphosus*, 0.3; staphylococci, 0.3 and 0.4; *B. coli*, 0.4; *B. tuberculosis*, 0.5; streptococci (average), 0.6 per cent. The higher organisms were more resistant—actinomyces requiring 2.3 per cent.; spirothrix, 2.8; blastomyces, 2.9; *Mucor mucedo*, 7.6; and *Aspergillus flavus*, 8.6 per cent. This research goes some way in placing on a scientific basis the theory as to the value of sour milk as an article of diet.—J. Infect. Dis.; through Chem. and Drug., 91 (1919), 39.

Lactic Acid.—*Manufacture of.*—Desborough, Reilly and Thayson have patented the following process: Sugar, such as maltose which may be obtained by the action of malt or molds on cereals, chestnuts, acorns, etc., dextrose, saccharose, mannite, raffinose, and arabinose are fermented with a new type of lactic acid producing organism—*Bacterium volutans*—found in sour mash, maize, or other cereal meal, soil, carrots and parsnips, and identified by the size and by the production of volutine which can be detected microscopically by staining with polychrome methylene blue solution. The acidity developed by the fermentation is reduced by repeated addition of sterilized alkali, or alkaline earth compounds, such as calcium carbonate or oxide. The lactates may be separated by evaporation and crystallization or by the formation of other lactates. These crude lactates are washed with small quantities of water and the wash liquors are worked up for the volatile acids such as acetic acid and butyric acid. The lactates are afterwards

decomposed by sulphuric acid or other acid and the lactic acid extracted with butyl or isobutyl alcohol. The volatile fatty acids are separated by distillation. The lactic acid obtained is purified by forming the lactide and afterwards reconverting the crystallized lactide into the acid. Solutions for fermentation may be obtained by treating brewers', distillers' or other washes which have been spoiled by entry of foreign organisms by saccharifying with malt if necessary and boiling.—J. Ind. Eng. Chem., 11 (1919), 1158.

Margosates.—*Use in Skin Lesions.*—Chatterjee has obtained satisfactory results from the use of ethyl ester margosic and mercury margosate in the treatment of syphilis, leprosy, filiriasis, septic infections and ulcers.—Ind. Med. Gaz.; through Chem. and Drug., 91 (1919), 1120.

Oleic Acid.—*Preparation of Pure.*—Moore gives the following method for preparing pure oleic acid: 100 grammes of the liquid fatty acids of olive oil, separated from the palmitic acid by the well-known Gusserow-Varrentrapp method, are dissolved in 250 mls of absolute alcohol, and to this solution 250 mls of an aqueous solution of lithium hydroxide, just sufficient to neutralize the acids, are added. On standing a beautiful crystalline precipitate is formed, which is collected on a filter, washed with dilute alcohol and decomposed by hydrochloric acid. The oleic acid is distilled under diminished pressure and forms a colorless and odorless liquid having an iodine value 89.5 and a saponification value 283, compared with the theoretical values 90 and 284, respectively.—J. Soc. Chem. Ind.; through Drug. Circ., 63 (1919), 551.

Oxalic Acid.—*Assay of.*—With the exception of formic acid, oxalic acid is the only common organic acid which yields carbon monoxide when heated with acetic anhydride at 100°. It decomposes briskly and quantitatively and therefore may be estimated gasometrically, says H. Krause. Soluble oxalates are first evaporated in the reaction tube with an excess of hydrochloric acid and insoluble oxalates are decomposed by a mixture of acetic anhydride and sulphuric acid (9 : 1). In the latter case, however, the results are not so good, as the mixture alone evolves some gas which does not dissolve in caustic potash, and, of course, the reaction is no longer confined to oxalic acid.—Ber.; through J. Soc. Chem. Ind., 38 (1919), 478A.

Commenting on the foregoing, E. Ott points out that the reaction was observed and explained by him in 1913 but that it was not utilized by him for analytical purposes.—Ber.; through J. Soc. Chem. Ind., 38 (1919), 512A.

Oxalic Acid.—*Botanical Significance of.*—M. Molliard believes that the presence of oxalic acid in plants is due to the fact that regardless of the alkalinity of the plant food, provision is made that the cell contents remain acid.—J. pharm. chim., 19 (1919), 458.

Oxalic and Acetic Acids.—*Production by Alkali-Sawdust Fusion.* S. A. Mahood and D. E. Cable state that the demand for acetic acid for war purposes has exceeded the supply and has led to the seeking of new sources of this substance.

It was found as the result of this investigation that when hard wood sawdust is heated to fusion with sodium hydroxide, 17 to 20 per cent. of acetic acid could be obtained. Oxalic acid to the extent of 50 per cent. of dry weight of the wood was also produced.

If the reaction is carried out in a closed vessel, methyl alcohol is also produced to the extent of 2.4 per cent. but if the temperature be raised above 200° the yield of oxalic acid is reduced. At lower temperature both formic and acetic acids are produced, amounting to about 15 per cent. each. The length of time of heating and the temperature of the fusion mixture materially affect the qualitative and quantitative yield.—J. Ind. Eng. Chem., 11 (1919), 651. (L. A. B.)

Copper Phenolsulphonate.—*Therapeutics of.*—G. L. Servoss recommends this copper salt as an intestinal antiseptic. He uses it in $\frac{1}{24}$ grain doses, prescribing 1 grain in 3 ounces of water, directing the administration of one teaspoonful of the solution every hour. He finds it of value in intestinal troubles of children.—The Prescriber; through Am. J. Pharm., 91 (1919), 124.

Phenylcinchoninic Acid.—*Change of Name.*—The Chemical Foundation, Inc., proposes to continue the wise policy of the Federal Trade Commission by requiring that those who receive licenses for the use of patents for synthetic drugs must use a common designation for each drug selected by the Foundation. Cinchophen has been selected as the designation for the substance introduced as

atophan (also described in the U. S. Pharmacopœia under "phenylcinchoninic acid"). In consideration of this action on the part of the Chemical Foundation and also because physicians found it difficult to use the pharmacopœial name phenyleinchoninic acid, the Council on Pharmacy and Chemistry has recognized the contracted term cinchophen as the name for the drug introduced as atophan.—J. Am. Med. Assoc., 73 (1919), 427. (W. A. P.)

Phenylcinchoninic Acid.—*Preparation of.*—Edward D. Davy in a paper read before the Columbus Branch of the American Pharmaceutical Association describes his work on the preparation of the drug formerly known as "atophan." Benzylidine-aniline was prepared by mixing molecular quantities of aniline and benzaldehyde and crystallizing the resulting product. Pyrrocemic acid is made by the destructive distillation of tartaric acid. The latter is mixed with potassium acid sulphate and subjected to distillation at a temperature not over 220° by the use of an oil bath. The resulting product is purified by redistilling and collecting the portion between 130° and 180° . An alcoholic solution of the benzylidine aniline is now made and the pyrrocemic acid added to it. After boiling the mixture for two hours the excess alcohol is distilled off and the phenylcinchoninic acid is crystallized out.—J. Am. Pharm. Assoc., 8 (1919), 281. (H. H. S.)

Phenylcinchoninic Acid.—*Quality of American-Made.*—The Laboratory of the American Medical Association examined 13 American brands of this chemical and found the melting points of the samples ranged from 204 to 213° (U. S. P. directs 210°); and their ash ranged from none to 2.8 per cent. (U. S. P. directs from none to 0.5 per cent.) The chemists state that some of the American brands were as pure as the original German atophan.—Rep. Lab. Am. Med. Assoc.; through Chem. Abstracts, 13 (1919), 2254.

Phthalic Anhydride.—*Preparation of.*—H. D. Gibbs in a preliminary paper states that a successful method has been worked out in the Color Laboratory of the U. S. Bureau of Chemistry, for the production of phthalic anhydride from naphthalene by the vapor phase oxidation of naphthalene in the presence of certain catalysts. Compounds of vanadium and molybdenum were found to be most efficient as catalysts. The best laboratory experiments gave a conversion equivalent to 82 per cent. of the theo-

retical yield. Efforts are being made to adapt the process to quantity production and results will be published later.—J. Ind. Eng. Chem., 11 (1919), 1031. (L. A. B.)

Phthalic Anhydride.—*Physical Properties and Tests.*—K. P. Monroe reports as a continuation of the work on the process for air oxidation of naphthalene to phthalic anhydride, that the melting point of the purified product exceeds by three degrees that previously recorded. This was found to be 130.84° for the pure product, and for a mixture of phthalic anhydride and phthalic acid a eutectic temperature of 129.74° C. was noted.

A sensitive test for the presence of phthalic acid in the anhydride is given by a co-worker, E. Q. Adams, and consists of titrating 0.5 gramme sample in acetone with N 10 solution of normal potassium phthalate in 80 per cent. alcohol, using brom-phenol blue as indicator.

In a second paper, Monroe reported on the freezing-point curve of mixtures of naphthalene and phthalic anhydride.—J. Ind. Eng. Chem., 11 (1919), 1116 and 1119. (L. A. B.)

Saccharin.—*After the War.*—Having satisfied a need during the sugar shortage, the manufacturers of saccharin appear not to be content to turn their talents and plants to better uses, but suggest that the great commercial sacrifices made in setting their works into operation to produce saccharin should be rewarded by permission to continue the traffic under post-war conditions. The referee board to which the saccharin question was referred in this country has by no means given a clean bill of health to the chemical, and the people need to be protected from the danger, or at least the deception, of a substitute for sugar which is in no sense a true food.—J. Am. Med. Assoc., 72 (1919), 729. (W. A. P.)

Saccharin.—*Food Value.*—That saccharin is harmless, and at the same time worthless as a provider of energy is now generally admitted. Its influence on the process of oxidation has not been previously investigated. Burge and Neill have previously shown that sugar, when ingested with other foods, stimulates the secretion of catalase, and, hence, increases the process of oxidation in the body. It is now found that saccharin has a much greater action in this direction than sugar. In this respect saccharin is, therefore, a positively helpful adjunct to the dietary. It is spe-

cially valuable in a disease such as diabetes, where the principal trouble is defective oxidation.—Science; through Pharm. J., 103 (1919), 321.

R. L. Stehle, discussing Burge's paper on the food value of saccharin, presents data that contradicts Burge's findings.—J. Am. Med. Assoc.; through Am. J. Pharm., 91 (1919), 811.

Saccharin.—*Assay in Tablets.*—A. Bonis discussing this topic points out that these tablets are composed either of saccharin or of sodium saccharinate, or of a mixture of these two substances, generally with the addition of sodium bicarbonate; the simultaneous presence of saccharin and saccharinate results from the partial action of saccharin on sodium bicarbonate either in the course of manufacture or by the slow action of moisture. Lactose is sometimes added. Two principal cases have to be considered: (a) If the tablet does not effervesce when dissolved in water the saccharin is present as saccharinate. (b) If effervescence results, free saccharin is present and reacts like an acid on the bicarbonate.

I. *No Effervescence.*—The alkalinity of the substance is first determined, so that the excess of NaHCO_3 can be estimated. For this purpose 100 mgm. of the product are dissolved in cold water and titrated with N/10 H_2SO_4 . One mil. N/10 $\text{H}_2\text{SO}_4 = 0.084$ gramme NaHCO_3 . To determine the saccharin the total sulphur is estimated. 100 mgm. are mixed with 2 grammes of a mixture of equal weights of sodium nitrate and carbonate, and the mixture is fused. It is allowed to cool, taken up with hot water, acidified with HCl , and precipitated when boiling with BaCl_2 in slight excess. The precipitate is filtered off, ignited, and weighed. 233 parts of BaSO_4 correspond to 183 of saccharin and 233 of sodium saccharinate.

II. *Effervescence.*—The alkalinity of the product is first determined and expressed in terms of NaHCO_3 as before. From another portion of the sample the free saccharin is extracted by anhydrous ether, the solution is filtered into a weighed vessel, the ether is evaporated off, and by weighing the amount of saccharin is ascertained. If the product consists of sodium bicarbonate and saccharin only the amount of NaHCO_3 saturated by the saccharin during solution is calculated, and then NaHCO_3 in excess + NaHCO_3 saturated + saccharin = practically 100. If the sum is less than 100 the saccharinate must be determined by ascertaining the amount of saccharin in the residue from the extraction with ether: NaHCO_3 in excess + NaHCO_3 saturated + saccharin +

sodium saccharinate = practically 100. If the sum is still less than 100 the lactose must be determined. The most common impurity is parasulphamide benzoic acid. It may be determined by hydrolyzing with dilute hydrochloric acid, and allowing the liquid to crystallize after boiling for two hours with a reflux condenser. The crystals may be filtered off, washed, dried, and weighed, or the acid may be dissolved in alcoholic ether, from which it can be again separated by evaporating off the solvent.—Ann. Falsif.; through Chem. News, 118 (1919), 96.

Saccharin.—*Tests for Impurities.*—Richmond and Hill describe in detail the tests of the various pharmacopœias for impurities in saccharin and make suggestions for improvements.—J. Soc. Chem. Ind.; through Chem. Abstracts, 13 (1919), 979.

Salicylic Acid.—*Action Compared with Other Antipyretics.*—Yamamoto finds that acetylsalicylic acid is a more efficient antipyretic than salicylic acid, yet no appreciable difference was found in the amount of the two compounds united with brain tissue. Novaspirin has a molecule nearly identical with that of acetylsalicylic acid, yet has much less distinct antipyretic action. Mesotan is also less active. It is suggested that novaspirin and mesotan are much less readily absorbed, and split up into salicylic acid before they become active.—Kyoto Igaku Zasshi; through Pharm. J., 103 (1919), 186.

Salicylic Acid.—*Assay in Presence of Salicyl Aldehyde.*—A colorless solution of salicyl aldehyde yields a yellow coloration when treated with a trace of alkali; the color is destroyed by acids and even by carbon dioxide. The aldehyde may, therefore, according to R. Berg, be used as the indicator in the titration of salicylic acid in a solution also containing salicyl aldehyde. To determine salicylic acid in an ethereal solution containing both substances, the solution is extracted several times with N 20 sodium bicarbonate solution and then with water; the last aqueous extract must give a yellow color with a drop of alkali solution. If this is not the case, all the acid has not been removed and the extraction must be repeated. The united extracts are titrated with N 20 sulphuric acid; this is added in small quantities at a time and the solution boiled to expel carbon dioxide. The final disappearance of the yellow color denotes the end-point of the titration.—Chem. Ztg.; through J. Soc. Chem. Ind., 38 (1919), 337A.

Salicylic Acid.—*Oleaginous Solution of.*—It is stated that an excellent preparation of salicylic acid for external use is obtained by slightly heating 15 grammes of salicylic acid with 100 grammes of castor oil.—Schweiz. Apoth. Ztg.; through Chem. and Drug., 90 (1919), 201.

Salicyl Group.—*Stability and Destruction of.*—Hanzlik and Weetzel find that aqueous solutions of sodium salicylate gradually deteriorate on keeping, the loss being greater in weaker solutions. This is due to a fungoid growth, since solutions containing chloroform as a preservative, and therefore free from fungi, do not deteriorate. Yeast destroys salicylate, but not nearly so actively as the fungoid growth, which occurs spontaneously in salicylate solutions. About 20 per cent. of the salicylate administered to normal human beings is destroyed, and is even greater in animals. In febrile conditions in men the amount of the salicyl radicle decomposed is double that of the normal; the same occurs with drug addicts, alcoholic and morphine habitués, in nephritis and in exophthalmic goiter. The decomposition does not appear to be the function of any special organ, such as the liver.—J. Pharmacol.; through Pharm. J., 103 (199), 562.

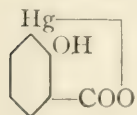
Sodium Salicylate.—*Assay of.*—Harrison and Carter point out that the quantitative test of the British Pharmacopœia for sodium salicylate gives varying results by different experiments on the same sample. They confirm a claim made by F. H. Alcock that this is due to the retention of part of the alkali in the carbonaceous matter which is filtered off. Even the method of Warrington, which with slight modifications is that of the U. S. P. IX, is apt to show slow results owing to the retention of alkali in the carbonaceous mass. The authors propose to obviate the difficulty by returning the lixiviated ash, together with the filter paper used, to the crucible and igniting at a dull red heat till all carbon is burnt off. The residue is dissolved in water and the filtrate of the first ignition is added. Now an excess of standard acid is added and the excess is determined by means of standard alkali.—Pharm. J., 103 (1919), 230. (C. P. W.)

Sodium Salicylate.—*Crystallization.*—J. W. Plenderleith found that a solution of one part of sodium salicylate in two or three parts of water will deposit upon standing large crystals similar to those of

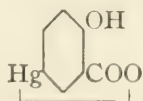
Rochelle salt. The British Pharmacopœia, 1914, states that a solution of one part of sodium salicylate in one part of water will deposit crystals containing 6 molecules of water.—Chem. and Drug., 91 (1919), 387. (K. S. B.)

Mercury Salicylate.—*Assay of.*—A. Costantino dissolves 0.25 gramme of mercury salicylate in 2 mls of concentrated sulphuric acid, heats it for about 6 minutes in a porcelain basin on a water-bath, and then dilutes to 160 mls with water. The solution is then electrolyzed for 14 minutes in a platinum dish, using a rotating platinum anode and a current of 5 volts and 6 amperes. The deposit of mercury is washed, without stopping the current, with distilled water, alcohol, and ether, and dried in a desiccator. In place of the platinum dish, a mercury cathode may be employed, in which case the volume of the solution should not exceed 30 mls, and the current should be 7–10 volts and 3 amperes.—Giorn. farm. chim.; through J. Soc. Chem. Ind., 38 (1919), 233A.

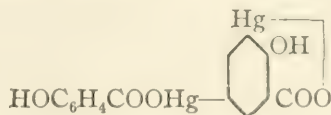
Mercurisalicylic Acid.—*Composition and Assay of.*—J. Gadamer finds: (a) that the official mercury assay of this compound should be revised; (b) that it would be preferable to substitute for the present Ph. Germ. assay, Rupp's method; (c) that the composition of the acid varies according to its method of preparation, being either one of the three compounds given below:



o-Mercurisalicylic acid.



p-Mercurisalicylic acid.



Dimercurisalicylic acid.

—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 136.

Potassium Sulphoguaiacolate.—*Tests for.*—Bayer finds that upon the addition of a few drops of nitric acid a red color results. The salt should have an alkaline reaction, should be completely soluble in 6 parts of water at 20° and should not lose more than 2.5 per cent. of its weight on drying at 100°.—Pharm. Post; through Chem. Abstracts, 13 (1919), 1370.

Tartaric Acid.—*Application of Fenton's Test for.*—Commenting upon the fact that Fenton's test for tartaric acid often fails with combined acid, such as Rochelle salt, "Abel Scholar" suggests

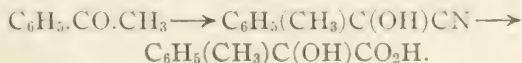
that to insure success, lead tartrate be prepared, collected, washed, decomposed with H_2S , excess H_2S removed, and the test then conducted as for tartaric acid *per se*.—Chem. and Drug., 91 (1919), 895. (K. S. B.)

Thyroxin.—*Constitution of.*—E. *C. Kendall discusses further (see YEAR BOOK, 1918, 312) the chemistry of thyroxin or *trihydrotri-iodo-keto-betaindolepropionic acid*. The article describes in detail the manufacture of thyroxin from fresh thyroids.—J. Biol. Chem.; through Chem. Abstracts, 13 (1919), 2538.

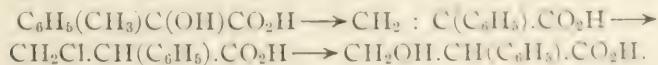
Thyroxin.—*Iodine Content of.*—The importance of iodine for the proper functioning of the healthy animal organism is beginning to be appreciated. This influence is purely physiological, and quite distinct from the therapeutic effect of the element and its compounds when administered in the treatment of disease. The minuteness of the quantities of iodine involved has made it difficult to obtain accurate determination of them. In the thyroid, where the iodine content amounts to milligrammes, it can be estimated by analytical methods. The far smaller amounts which must be assumed to circulate incidentally to their physiological action have hitherto eluded chemical determination. Recently, through refinements in these methods, Kendall has been able to estimate the amount of iodine in the blood at approximately 0.015 Mgm. in 100 mils. The content of the tissues is slightly greater, 0.04 Mgm. in 100 grammes. These figures indicate the extremely small amount of iodine compounds that seem to be essential to metabolic needs. Crystalline thyroxin, which Randall regards as the active physiological hormone of thyroid, contains about 60 per cent. of iodine. One Mgm. of thyroxin increases the metabolic rate about 2 per cent. in an adult weighing 150 pounds. This figure appears to be in reasonable accord with the quantities of iodine actually found in the circulation. If only a single dose of thyroxin is given, demonstrable action may fail to appear. Three or four successive daily administrations are necessary to give evidence of hyperthyroidism. This is accounted for by the fact that as much as 60 per cent. of the quantity given may be rapidly eliminated in the bile. In one instance 8 per cent. was found in the urine. It is only the continued presence of the iodine compound within the body which results in metabolic activity. These results have an obvious bearing on thyroid therapy.—J. Am. Med. Assoc.; through Pharm. J., 103 (1919), 537.

Valerates.—*Determination of Purity of.*—The purity of valerates is determined by H. Droop Richmond and W. T. T. Ainsworth as follows: Place 1/500 of the molecular weight, expressed in grammes, in a flask of about 300 mls capacity. With sodium, potassium, or lithium salts, add 25 mls of N/10 sulphuric acid; with zinc, iron, quinine, etc., add 35 mls N/10 sulphuric acid and 10 mls N/10 sodium hydroxide. In the latter case an excess of sodium acid sulphate is provided, which eliminates the presence of free sulphuric acid, which is slightly volatile in steam. Make up to 100 mls and distil 90 mls. The valeric acid is titrated in the distillate, phenolphthalein indicator. To check this result, the base may be estimated in the residue by titrating the free acid and subtracting from the amount added. Menthyl valerate requires saponification. Hydrolyze 2 grammes with 10 mls normal alcoholic potassium hydroxide for one hour and neutralize with normal sulphuric acid. Transfer to a separator and extract with 15 + 10 + 10 + 10 mls of chloroform. Make up the mixed liquids to 50 mls and examine in a 100 mm. tube (per cent. menthol = $\frac{\text{rotation} \times 25}{-59} \times 100$). To the aqueous portion add 6 mls normal sulphuric acid, make up to 100 mls, distil 90 mls and titrate.—Chem. and Drug., 91 (1919), 828. (K. S. B.)

Tropic Acids.—*Isomeric.*—McKenzie and Wood present a convenient and more practical method than those hitherto published for the synthesis of tropic acid starting from atrolactic acid which may be obtained in 73 per cent. yield from acetophenone through its cyanohydrin by the usual methods.



On distillation under diminished pressure atrolactic acid gives a 72 per cent. yield of atropic acid which on treatment with dry hydrogen chloride in ethereal solution is converted into β -chlorohydratropic acid. The substance on boiling with aqueous sodium carbonate gives tropic acid in 70 per cent. yield.



r-Tropic acid thus obtained melts at 116°–117°. By means of the quinine salt the *d*-acid was obtained in lustrous needles, melting

point 128° – 129° , and $[\alpha]_D^{16} = +72.2^{\circ}$ in ethyl alcoholic solution ($c = 2.695$). The *l*-acid obtained by means of morphine had melting point 128° – 129° C., $[\alpha]_D^{13} = -72.5^{\circ}$ for $c = 2.578$ in alcohol, and $[\alpha]_D^{15} = -79^{\circ}$ for $c = 1.538$ in aqueous solution.—Chem. Soc. Trans.; through J. Soc. Chem. Ind., 38 (1919), 654A.

ALKALOIDS.

Alkaloids.—*Adsorption in Drugs.*—H. Palme describes several series of experiments to prove the presence of adsorptive properties between alkaloids and other plant constituents. From experiments on *nux vomica*, *ipecac*, *cinchona* and *licorice* it appears certain that when an alkaloid-bearing drug is treated with a liquid, in which the alkaloid in question is soluble, a certain amount always remains undissolved, which compared with the weight of drug involved increases with the concentration of the solution. It is further shown that an alkaloid-free drug is capable of attracting the dissolved alkaloidal principle in solution. These phenomena indicate the necessity of giving greater heed to the methods employed in alkaloidal determinations.—J. Am. Pharm. Assoc., 8 (1919), 586. (H. H. S.)

Alkaloids.—*Assay of.*—Rapp suggests precipitation of the alkaloids from acid aqueous solution by the addition of an alkali and extraction by means of chloroform; for the latter operation the aqueous solution is converted into a thick mud by the addition of plaster of Paris, so that the chloroform separates readily. The alkaloids in the combined chloroform extracts are then dissolved out by $N/10$ or $N/100$ hydrochloric acid and the excess acid is measured by titration of an aliquot portion using methyl red as indicator. The method possesses the advantage of economy in time and material.—Apoth. Ztg.; through J. Soc. Chem. Ind., 38 (1919), 336A.

Rapp supplements the foregoing by a second paper pointing out the necessity of using a good alabaster gypsum, pointing out that the presence of fat, resins, chlorophyll and other protective colloids produce troublesome emulsification. He then discusses the preparation of extract of *belladonna* and the difficulties encountered in assaying it.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2963.

K. Dieterich finds the Rapp assay quite satisfactory but the amount of plaster of Paris should be such that the mixture does not

harden but remains as a soft paste. In the original method it is necessary to make sure by an extra shaking with 10 mls of chloroform that all the alkaloid has been extracted from the mass. This uncertainty may be avoided by dissolving the alkaloid in chloroform before adding the plaster and then using an aliquot portion of the filtered extract for the determination. For instance, in the valuation of cinchona bark, the substance is treated with the quantity of liquid recommended by Rapp and then shaken in the same flask with 50 mls of chloroform, made alkaline, and shaken with 25 grammes of plaster of Paris. The chloroform is then filtered off, and the filtrate (42-45 mls) shaken with N 10 acid. The plaster paste in this method may be of any degree of stiffness, as it does not have to be washed out, all the alkaloid having been dissolved by the chloroform before the addition of the plaster. It is suggested that the principle of Rapp's method might be extended to other extraction operations besides those with alkaloids, since the plaster has a clarifying effect and assists the separation of the extract.—Pharm. Ztg.; through J. Soc. Chem. Ind., 38 (1919), 336A.

Heiduscka and Wolf find Rapp's method gives low results with cinchona bark. They eliminate the error by heating 3 grammes of the bark in an Erlenmeyer flask with 15 mls of N 2 hydrochloric acid, then, after cooling, shaking 5 minutes with 60 mls of chloroform and 3 mls of 20 per cent. sodium hydroxide solution and then for another minute after adding 30 grammes of plaster of Paris. Then pass the quickly separating chloroform through a filter, transfer 50 mls of it (representing 2.5 grammes of bark) into a stoppered cylinder, shake for 2 minutes with 12.5 mls of N 10 hydrochloric acid V. S. Dilute this solution with 12.5 mls of water and titrate 20 mls (representing 2 grammes of the bark) with N/10 alkali, using methyl red as indicator.—Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 3273.

Alkaloidal Assays.—L. R. DeRosemont believes that the use of diluted mineral acids in alkaloidal extraction causes a variability in the results of assay and advocates for extraction such organic acids as acetic, oxalic, tartaric, citric and beta-naphthalenesulphonic acids. The article gives details of such extractions and percentage yields by the several methods.—Bull. sci. pharmacol.; through Chem. Abstracts, 13 (1919), 991.

L. Reutter, discussing the foregoing, states that good results are obtained by the following procedure: Treat 50 grammes of the

powdered drug with 200 grammes of boiling water containing 5 grammes of the acid, filter hot, decant from the separated oil or resin, extract the remaining traces with ether or petroleum ether, evaporate the solution to small bulk and precipitate the alkaloid by a suitable base. Redissolve and isolate the pure alkaloid by usual methods. Analytical results of the examination of twenty-six drugs with each of the five acids are tabulated, the results showing close agreement.—Schweiz. Apoth. Ztg.; through Pharm. Era, 52 (1919), 169.

Alkaloids.—*Neutralization of.*—Sturm van Leeuwen has made the interesting observation that pilocarpine dissolved in rabbit's serum in the course of twenty-four hours progressively loses its property of exciting the intestinal muscle of a cat. Sera of other animals exhibited this neutralizing effect in a minor degree, dog's serum being quite inactive. The disappearance of this property of pilocarpine was not due to a destruction of the alkaloid, as it could be recovered and then displaced its characteristic effects. The author found that these neutralizing agents were present not only in the serum, but also in varying proportions in the liver and other organs, and he assumes that the divergences in the action of alkaloids on animals is due to variations in susceptibility consequent on the presence of these bodies in varying proportions.—Arch. Neerl. Phys.; through Chem. and Drug., 91 (1919), 404.

Alkaloids.—*Precipitation by Licorice.*—Upon observing a precipitate in a prescription bottle which was returned for refilling, the prescription having contained tincture of nux vomica, fluidextract of licorice and water, J. W. Plenderleith conducted experiments which indicated that quinine and strychnine are almost entirely precipitated as an insoluble glycyrrhizinate from solutions which contain licorice, and recommends that this flavoring agent be not used with alkaloidal drugs in solution.—Chem. and Drug., 91 (1919), 386. (K. S. B.)

Aconitine.—*Color Test for.*—None of the identification reactions of aconitine is characteristic. Dragendorff's test, consisting in heating aconitine with phosphoric acid until fumes are evolved, is given, according to various authors, only by amorphous aconitine and cleavage products of aconitine, while the crystallized alkaloid gives only a gray and not violet color. Palet finds that when

crystallized aconitine is heated under the above conditions with a few drops of a solution of 1 gramme of ammonium molybdate in 25 mils of concentrated phosphoric acid, a beautiful violet color is produced, which is obtained with no other alkaloid with the exception of aspidospermine and veratrine. Since, however, these alkaloids produce other specific reactions with alkaloidal reagents, they can easily be distinguished from aconitine.—J. pharm. chim.; through Drug. Circ., 63 (1919), 381.

Adrenaline.—*Antitoxin Action of.*—At a meeting of the Société der Biologie, A. Marie stated that injections of solutions of neutral salts of adrenaline or emulsions of the suprarenal gland had marked antitoxic action on the tetanus toxin.—Compt. rend.; through J. pharm. chim., 20 (1919), 103.

Adrenaline.—*Administration with Arsenobenzol.*—G. Milian ("Presse Med.") recommends the use of adrenaline prior to injecting arsenobenzol; a conclusion concurred in by Nageli ("Corresp.-Bl. Schweiz. Aertze") and Beeson ("Am. J. Syph.").—Am. J. Pharm., 91 (1919), 555.

Anhalonium Alkaloids.—Seven different bases have been isolated from various species of cactus, and investigated chiefly by Heffter (1895–1905). E. Spaeth shows that they are derivatives of β -phenylethylamine. Thus, anhaline is β -*p*-hydroxyphenyldimethylethylamine, $\text{HO.C}_6\text{H}_4.\text{CH}_2.\text{CH}_2.\text{N}(\text{CH}_3)_2$, identical with hordenine, and mezcaline is shown by synthesis to be β -3,4,5-trihydroxyphenylethylamine. Anhalamine, anhalonidine, and pello-line are methylated 3,4,5-trihydroxyphenylethylamines, but anhalonine and lophophorine each contain two of their three oxygen atoms in a different kind of linking.—Monatsh. Chem.; through J. Soc. Chem. Ind., 38 (1919), 843A.

Aniline.—*Detection in Aqueous Solution.*—W. G. O. Christiansen employs a colorimetric method depending upon the formation of Runge's violet. It is as follows: To 5 mils of the liquid to be tested, are added in order, 1 drop of a diluted solution of sodium hydroxide, 3 drops of a saturated aqueous solution of phenol, and 4 mils of a saturated aqueous solution of bleaching powder, freshly prepared and filtered. The mixture, after the lapse of one-half hour, is added to 50 mils of water, and the color noted compared

with that produced with water containing, respectively, 0.10 per cent., 0.15 per cent., 0.20 per cent., 0.25 per cent., 0.30 per cent., 0.35 per cent., 0.40 per cent. and 0.50 per cent. of aniline, when treated in a like manner. As the standards used for comparison are not stable, it is suggested that comparison standards made by mixing red and blue inks, in suitable proportion, be employed. In order to simulate the opaque appearance noted in case of the test liquid, finely powdered chalk may be added.—J. Ind. Eng. Chem., 11 (1919), 763. (G. C. D.)

Apomorphine.—*Oxidation of.*—It has already been shown that when morphine is digested with unsterilized food substances no apomorphine is produced, nor is such the case with ferments in the presence of chloroform, toluol, or sodium fluoride. Experiments by E. Winterstein with fungi and bacteria have shown that neither *Aspergillus* nor *Penicillium* splits up cocaine with formation of an oil with a basic reaction, probably a pyrrol derivation; in no case, however, was benzoic acid produced; bacteria, on the other hand, readily do so. Neither fungus produces apomorphine from morphine. Apomorphine hydrochloride yields by oxidation with dilute solution of potassium ferricyanide a substance soluble in benzol with production of an intense amethyst-violet color; this is an exceedingly delicate test for apomorphine. By a rather lengthy process (details in the original), an oxidation product was obtained in absolutely black crystals soluble in chloroform with intense violet color similar to that produced when an apomorphine solution is carefully oxidized with potassium bichromate and shaken with chloroform.—Schweiz. Apoth. Ztg.; through Pharm. J., 103 (1919), 3.

Belladonna Alkaloids.—*Are They Volatile in Steam?*—A. E. Tsakalotos cites a case where a distilled liquor was made from gentian that had become admixed with belladonna. The question was whether the alcoholic distillation was dangerous because of presence of belladonna alkaloids. After a study of the matter, the author decides in the negative, finding no alkaloid reaction or mydriatic effect from various distillates of belladonna.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2415.

Berberine.—*Extraction from Argentine Plants.*—F. Richert describes two plants, "Michai" (*Berberis darwinii*) and "calafate,"

(*Berberis vuxifolia*) growing largely in the Patagonian Cordiller as from which berberine can be obtained; the yield from "michai" root being 8.9 per cent. of crystallized alkaloid. Details of extraction are given in the article.—Bull. Agr. Intelligence; through Chem. Abstracts, 13 (1919), 1242.

Beta-Homochelidonine.—*Occurrence in Macleaya Cordata.*—From the roots of this plant, K. Momoya has extracted protopine and beta-homochelidonine. From the latter, the author prepared two iodo-derivatives, a methyl sulphate, and a new base, *dehydro-beta-homochelidonine*.—J. Pharm. Soc. Japan; through Chem. Abstracts, 13 (1919), 1459.

Caffeine.—*Assay of.*—Power and Chesnut assay vegetable material for caffeine by the following method: Ten grammes of the material to be examined are first moistened with alcohol and then extracted with hot alcohol, in a Soxhlet apparatus, for a period of 8 hours. After cooling, the extractive matter thus obtained is added to 100 mls of water, in which 10 grammes of heavy magnesium oxide have been suspended, and the mixture evaporated practically to dryness, at a low temperature. The residual matter thus obtained is added to hot water, stirred well and afterward filtered. The residue on the filter is washed with hot water in such quantity that the washings when added to the original filtrate will measure about 250 mls. To this liquid are added about 20 mls of diluted sulphuric acid, and the whole boiled for at least half an hour. This is for the purpose of hydrolyzing saponins. After the liquid has cooled, it is extracted by shaking with six portions of chloroform, measuring 25 mls each. The combined chloroformic liquids are then shaken with 5 mls of a 1 per cent. solution of potassium hydroxide, and filtered. The chloroform is removed by distillation, and the caffeine, after being thoroughly dried, weighed. The same authors have examined the leaves of *Ilex vomitoria*, a shrub indigenous to our southern states, for caffeine content. This was found to be present in amounts varying from 0.30 per cent. to 1.67 per cent., in the air dried leaves.—J. Am. Chem. Soc., 41 (1919), 1298 and 1307. (G. C. D.)

Caffeine.—*Assay in Antipyrine-Caffeine Citrate.*—Ferman dissolves 0.5 gramme of the substance in 20 mls of water, adds 80 mls of 1 per cent. picric acid and filters after shaking. To 50 mls of the clear filtrate he adds 5 mls of 15 per cent. potassium

hydroxide solution and then shakes out with 2 portions of chloroform, 20 mls each. The chloroformic solution is evaporated and the caffeine weighed after drying at 100° .—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 1369.

Caffeine.—*Test Distinguishing from Theobromine.*—F. P. Stroup gives two methods of applying a solution of potassium dichromate: (a) In concentrated sulphuric acid to caffeine and theobromine to obtain color reactions which vary sufficiently to distinguish between these two alkaloids. When these alkaloids are spread separately on a white porcelain surface and two drops of the reagent are added, the yellow color of the reagent is almost immediately changed to a bright bluish green in the case of the caffeine while in the case of theobromine the yellow color is generally first changed to a dark purplish which gradually changes to a purplish green, later an olive-green and finally to the same bluish green given by caffeine. (b) If a few drops of the reagent are placed on a white porcelain surface and the alkaloids are added separately, the caffeine dissolves promptly and the color changes to a bright bluish green and finally green. With theobromine, solution is slower and colors change to purplish green, olive-green and finally bright green.—Proc. Penna. Pharm. Assoc., 42 (1919), 161. (R. P. F.)

Cinchona Alkaloids.—*Syntheses of.*—Interest in the cinchona alkaloids as material for chemotherapeutic study having recently been revived by the remarkable specificity for the pneumococcus shown by ethylhydrocupreine, Michael Heidelberger and Walter A. Jacobs have undertaken an investigation to test the possibilities for synthetic work in this field, their work dealing with a number of cinchona alkaloids, their reduction products and certain synthetic homologs of the latter.—J. Am. Chem. Soc., 41 (1919), 817. (J. M. L.)

Oxydihydrocinchonines.—*Constitution of.*—E. Léger has previously shown that α -oxycinchonine is really an oxydihydrocinchonine, resulting from the fixation of H_2O at the double bond of cinchonine. To find out whether the β -isomere has the same origin he has studied the action of hydrobromic acid and sulphuric acid on it. Like the α derivative the so-called β -oxycinchonine

did not yield a hydrobromo derivative containing an O more than cinchonine, but hydrobromocinchonine and hydrobromoapocinchonine. These two compounds were accompanied by isomers of cinchonine—cinchonigine cinchononiline, apocinchonine, δ -cinchonine, and some unaltered β -oxycinchonine. When 50 per cent. sulphuric acid acts on the β -isomer cinchoniline is the chief product, mixed with cinchonigine, and the same compounds are obtained with 70 per cent. acid, the yields being increased. Thus the so-called β -oxycinchonine is really an addition product of water and cinchonine. The α and β compounds are stereoisomeres and their rotatory powers differ only slightly.—Compt. rend.; through Chem. News, 118 (1919), 191.

Cocaine Hydrochloride.—*Melting Point of.*—A. Jermstad in studying the melting point of cocaine hydrochloride, using a pure salt containing not more than 1.63 per cent. of water found that the variations in the melting point as given in various pharmacopœias (from 182 to 191°) are due to the mode of heating. By keeping the sulphuric acid in which the capillary tube is immersed at 175 to 178° for 10 minutes and then raising the temperature 1° for each minute a uniform melting point of 180 to 181° was obtained. Lower melting points that have been reported are due to partial decompositions due to careless heating. He concludes that samples responding to the usual tests for purity should not be rejected, because of irregularity of melting point.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 2971.

Cocaine Hydrochloride.—*Spurious.*—J. Herzog reports on a (German) cocaine hydrochloride, carefully packed in tins and labelled as such, which consisted entirely of magnesium sulphate in minute crystals, apparently specially prepared for this purpose so skilfully as not to attract immediate attention.—Apoth. Ztg.; through Pharm. J., 103 (1919), 247.

Cocaine, Heroin and Veronal.—*Detection and Assay of.*—P. A. E. Richards acidified aliquot portions of the various organs and liquids with acetic acid and extracts with warm alcohol; the alcoholic extracts are concentrated, filtered, clarified, if necessary, with lead acetate, the excess of lead removed as sulphide, and the solutions then acidified with acetic acid and extracted with ether. The residues obtained from the ether extracts are weighed

and examined for veronal (diethylbarbituric acid), sulphonal (diethylsulphonedimethylmethane), etc. The aqueous solutions, after the ether extraction, are rendered ammoniacal, extracted with chloroform, the chloroform extracts shaken with dilute hydrochloric acid, the acid extracts again rendered ammoniacal and re-extracted with chloroform. The residues from the chloroform extracts are tested for alkaloids; if cocaine is suspected to be present, the residues may be extracted with benzene in which this alkaloid is distinctly soluble. Trional (diethylsulphonemethyl-ethylmethane), sulphonal, and tetronal (diethylsulphonedimethylmethane) are best identified by their melting points; trional, 75° ; sulphonal, 125° ; tetronal, 85° . Veronal has the melting point 191° ; it sublimes completely and the crystals obtained when the substance is evaporated with ammonia differ from those yielded by trional and sulphonal under the same conditions. Various tests for heroine (diacetylmorphine) and cocaine are discussed. The alum-potassium permanganate test for cocaine described by Hankin was found to give excellent results.—*The Analyst*; through J. Soc. Chem. Ind., 38 (1919), 512A.

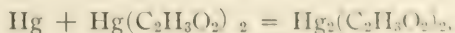
Cocaine and Stovaine.—*Microchemical Test for.*—Denigès reports that with platinum chloride a 1 per cent. stovaine hydrochloride solution yields a fine granular precipitate, but a precipitate does not form if the concentration of the stovaine solution is as low as 0.5 per cent. Cocaine hydrochloride solution of either strength gives a characteristic crystalline precipitate of the platinum-chloride. Both alkaloids give yellow crystalline precipitates when treated with gold chloride, but the microscopic appearance of the crystals is different. Stovaine picrate forms yellow crystals, while cocaine picrate appears as amorphous granules which change to liquid droplets when stirred.—*Bull. soc. pharm. Bordeaux*; through J. Soc. Chem. Ind., 38 (1919), 198A.

Conessine.—*Properties of.*—This alkaloid isolated by Polstorff in 1888 from the bark of *Holarrhena africana* has been given further study by F. Ulrici, who obtained it in pure form as crystals melting at 125° , having the molecular weight 342 and having presumably the formula $C_{23}H_{38}N_2$. It seems to be identical with Warnecke's *wrightine* (1888). Ulrici prepared a number of derivatives of conessine.—*Arch. Pharm.*; through Chem. Abstracts, 13 (1919), 1456.

Discussing the foregoing paper, Giesma and Halberkann state that the bark of *Holarrhena africana* contains as much as 0.8 per cent. of conessine. They think its formula is $C_{24}H_{41}N_2$, and find it is a tertiary base, containing 4 alkyl groups. It gives a number of color reactions, has the optical rotation of 21.67° at 20° . The authors prepared a number of derivatives of the alkaloid. —Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1458.

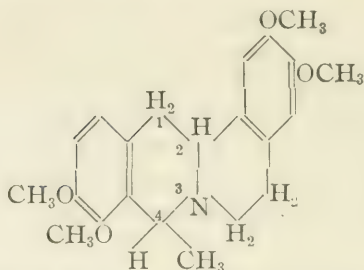
Conessine and Holarrhenine.—*Occurrence in Holarrhena Congolensis.*—By extracting the bark of the trunk of *Holarrhena congolensis* with very dilute hydrochloric acid, making alkaline with ammonia, and extracting with chloroform, F. L. Pyman obtained a dark viscous residue from which were isolated a new alkaloid, holarrhenine, $C_{24}H_{38}ON_2$, and conessine, $C_{24}H_{41}N_2$, which had previously been obtained from other species of the same genus. These alkaloids possess a local anesthetic action but are of no practical value, since they produce local necrosis when injected. The alkaloids are separated by extracting the crude extract, first with light petroleum and then with ether, and purifying the products; the petroleum extract yields most of the conessine, amounting to 0.25 per cent. of the bark, and the ether extract the holarrhenine in small quantity. The conessine is characterized by its acid oxalate, melting point 280° (corr.), and the holarrhenine by its hydrobromide, melting point $265\text{--}268^\circ$ (corr.) after drying. Conessine melts at 125° (corr.) and has $[\alpha]_D = -1.90^\circ$ in chloroform solution. Holarrhenine melts at $197\text{--}198^\circ$ (corr.) and has $[\alpha]_D = -7.1^\circ$. The latter contains a hydroxyl group, and both alkaloids contain three N-alkyl groups, probably methyl.—Chem. Soc. Trans.; through J. Soc. Chem. Ind., 38 (1919), 231A.

Corydalis Alkaloids.—*Mercuric Acetate as Oxidizer of.*—H. Legerlotz finds mercuric acetate superior to iodine as an alkaloidal oxidizer. The mercury can be eliminated either by use of hydrogen sulphide or by shaking with metallic mercury in the cold, in which event the reaction runs:



the solubility of the latter at 21° being 0.1024 gramme in 100 mls of water.

The article states that the formula of corydaline is



It melts at $135-6^{\circ}$; has the optical activity, $\alpha_D = 299.8^{\circ}$; and is triboluminescent.

Corycavine, $C_{23}H_{23}O_6N$, is an oxidation product melting at $215-6^{\circ}$; *corycavidine*, $C_{22}H_{25}O_5N$, melts at $209-10^{\circ}$ and has the optical activity, $\alpha_D = +203^{\circ}$; while the corycavamine melts at $148-9^{\circ}$ and has the optical activity, $\alpha_D = +166^{\circ}$.

A number of other derivatives are described in the paper.—*Arch. Pharm.*, 13 (1919), 1361.

Cotarnine.—*Inefficiency of.*—P. J. Hanzlik has made a thorough investigation of the efficiency of hemostatics and has shown the inefficiency of cotarnin salts. The evidence was so definite that the Council on Pharmacy and Chemistry has directed the omission of the general article on cotarnin salts and the description of Styptol from New and Non Official Remedies.—*J. Am. Med. Assoc.*, 73 (1919), 1628. (W. A. P.)

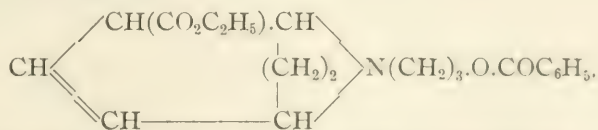
Cryptopine.—W. H. Perkin reports on a detailed study of the reduction products of anhydrocryptopine methosulphate, cryptopine methochloride, isocryptopine chloride, ψ -cryptopine chloride, and isoanhydrocryptopine. In most cases different products were obtained by reduction in acid and in alkaline solution with sodium amalgam and frequently reduction was accompanied by disruption of one or other of the isoquinoline rings or of the ten-membered ring characteristic of cryptopine. In the case of ψ -cryptopine chloride and dihydromethylisoanhydrocryptopine methosulphate a remarkable decomposition resulting in the elimination of a nitrogen atom in the reduction with sodium amalgam at ordinary temperatures was observed.—*Chem. Soc. Trans.*; through *J. Soc. Chem. Ind.*, 38 (1919), 653A.

Diacetyl-Morphine Hydrochloride.—*Solubility in Chloroform.*—F. J. Keenan and George Éwe point out the U. S. P. IX statement

that this salt is insoluble in chloroform is incorrect as it is soluble in this solvent to the extent of 3 parts in 100.—*Proc. Penna. Pharm. Assoc.*, 42 (1919), 172. (R. P. F.)

Diuretin.—*Process for Making.*—G. Dall'Acqua proceeds as follows: 110.5 grammes of sodium hydroxide, free from carbonic acid, are dissolved in an equal quantity of water, 497.2 grammes of theobromine previously moistened with 150 mls of alcohol are then added and the mixture, which becomes warm, is stirred well. When the reaction is finished, the mass is cooled, triturated with 442 grammes of sodium salicylate and dried in an oven over slaked lime.—*Boll. chim. farm. Milan*; through *Pharm. Weekblad*, 56 (1919), 1327. (H. E.)

Eckaine.—*Pharmacology of.*—*N*-Benzoylhydroxypropylnorecgonidine ester, or eckaine,



is a crystalline base, giving a water-soluble hydrochloride which in neutral solution can be sterilized at 100° C. without decomposition. According to W. Wichura it is only slightly toxic, acts on the respiratory center similarly to cocaine but to a lesser degree, and is a powerful local anesthetic. Its administration causes at first a lowering, often followed by an increase, of the blood pressure. The anesthetic action of other norecgonidine derivatives such as hydroeckaine, or the corresponding hydroxyethyl and hydroxyamyl compounds, is much weaker than that of eckaine. The tropic acid ester of homotropine, "mydriasine," acts on the pupil and vagus like atropine, and is an equally powerful mydriatic. In all these respects it is superior to the benzoic and mandelic esters, and to the tropic acid ester of dimethylaminopropanol.—*Z. exper. Path. Therap.*; through *J. Soc. Chem. Ind.*, 38 (1919), 598.

Emetine.—*Color Reactions of.*—A. Lahille reports the following color reactions with emetine hydrochloride: Calcium chloride, yellow; concentrated sulphuric acid and ammonium molybdate, green, then blue; sulphuric acid and dichromate, green, then blue; concentrated nitric acid, yellow.—*Arch. méd. exp.*; through *Chem. Abstracts*, 13 (1919), 3114.

Emetine.—*Use in Hemoptysis.*—Emetine hydrochloride, administered hypodermically in doses of 0.04 gramme in 1 mil of solution, has proved the most effective of all remedies tried in arresting a tendency to pulmonary hemorrhage in tuberculosis. According to A. W. Blasto, the injection caused no pain or inflammation, even when three successive doses were given in twenty-four hours. In cases with fever, or in the sub-acute form of tuberculosis, the treatment is without effect. The therapeutic action is due to its effect on smooth muscle and selectively on the broncho-pulmonary vessels. In prescribing emetine the danger of its causing abortion must be borne in mind in cases of pregnancy.—*Plus Ultra*; through *Pharm. J.*, 103 (1919), 362.

Emetine Hydrochloride.—*Notes on.*—George E. Éwe says that the preparation of this alkaloid from ipecac presents the problem of separating it from the drug in a condition of comparative freedom from the alkaloid cephaeline. He thinks the test required by the U. S. P. covering this point, if literally interpreted would exclude the major part of the emetine hydrochloride found on the market. He gives a quantitative test which he suggests should be resorted to in the event of an apparently excessive proportion of cephaeline being indicated by the U. S. P. limit test. The adoption of an upper limit of 3 per cent. of cephaeline in connection with a quantitative test would insure the absence of excessive proportion of cephaeline in the emetine hydrochloride on the market.—*Am. J. Pharm.*, 91 (1919), 275. (J. K. T.)

Emetine Bismuth Iodide.—*Assay and Quality of.*—Emetine bismuth iodide has attracted some attention as a means of administering emetine in the treatment of amebic dysentery. Emetine bismuth iodide should contain from 17 to 23 per cent. of emetine, and from 15 to 20 per cent. of bismuth. Of two commercial specimens of the compound examined by W. Rabak, one gave 29.73 per cent. of emetine by weight, and 23.75 per cent. by titration. The other gave 27 per cent. by weight and 21.3 per cent. by titration. This difference in the two methods of analysis was attributed by one manufacturer to alteration of the alkaloid by heat and reagents. It is possible that rapid evaporation of the ether, in the method of extraction, may have caused hydrolytic or other changes in the base. This view is borne out by the fact that if the solvent is allowed to evaporate spontaneously, and the residue is dried

over sulphuric acid, rather than by heat, more concordant results are obtained. The bismuth present in the two specimens was found to be, respectively, 16.73 and 17.51 per cent. Another sample, in cachets, gave 22.8 per cent. of emetine by weight, and 17.95 per cent. by titration. A limit for free emetine in the preparation is established by shaking 0.1 gramme of the salt with 10 mls of decinormal hydrochloric acid for 15 minutes, and filtering; then diluting 1 ml of the filtrate to 100 mls with water, and adding one drop of Mayer's reagent to 5 mls of the liquid. No distinct turbidity should appear. Emetine bismuth iodide is slightly more soluble in water than in 1 : 200 hydrochloric acid; in each case slight decomposition occurs with liberation of emetine. In 1 : 100 sodium bicarbonate solution, and in solutions of bile salts, it is more soluble, with correspondingly greater decomposition.—Rep. Lab. Am. Med. Assoc.; through Pharm. J., 103 (1919), 402.

Ergotinine.—*Detection of.*—Tanret found that when a solution of ergotinine in ether, or still better in acetic ether, is underlaid with concentrated sulphuric acid an orange ring is formed at the zone of contact of the liquids, the color changing to violet and finally to blue. Keller has made the reaction more sensitive by adding to the sulphuric acid a trace of ferric chloride. L. Wolter recommends replacing ferric chloride by hydrogen dioxide solution. Three mls of concentrated sulphuric acid is overlaid with a solution of a trace of ergotinine in 3 mls of acetic ether and when a colored ring has been formed one drop of hydrogen peroxide solution is added. When as little as one mgm. of ergotinine is present a dark blue ring is formed immediately.—Chem. Zeit.; through Pharm. Weekblad, 56 (1919), 659. (H. E.)

Erythrophleine.—*Use in Dentistry.*—Norman Black states that the bark of *Erythrophloeum guineense*, called sassy, cascá or ordeal bark, contains an alkaloid, *erythrophleine*. A 50 per cent. solution of the hydrochloride of this alkaloid in eugenol has been named *throphleol* and is found of value in devitalizing the dental pulp.—Dental Cosmos; through Chem. Abstracts, 13 (1919), 1126.

Ethylmorphine Sulphate.—*Water of Crystallization in.*—James L. Thompson determined that ethylmorphine sulphate crystallizes with 5 molecules of water. It is soluble in 9.5 parts of water, or in 111 parts of 90 per cent. alcohol, at 15.5°.—Chem. and Drug., 91 (1919), 1511. (K. S. B.)

Gelsemium.—*Final Report on Alkaloids of.*—L. E. Sayre and G. N. Watson extracted gelsemium in No. 20 powder with 70 per cent. alcohol. The extract, after removal of the alcohol, was made alkaline with ammonia and the alkaloid dissolved out with chloroform. After concentration, hydrochloric acid was added and later sodium nitrate was used to precipitate the sempervirine nitrate. Precipitation was repeated several times and the salt finally crystallized from an alcoholic solution. The acid filtrate was partly neutralized and then extracted with chloroform to remove gelsemic acid. The acid solution was then made alkaline with ammonia and treated with ether to remove gelsemine and later with chloroform to remove other alkaloids. The ether solution containing the gelsemine was treated with hydrochloric acid and after purification by washing with alcohol, pure white gelsemine hydrochloride was obtained. The chloroformic solution representing the so-called amorphous alkaloids after removing the gelsemine was dried, dissolved in absolute alcohol and treated with hydrochloric acid. The precipitated hydrochlorides were washed with chloroform which dissolved an amorphous portion leaving a heavy brown crystalline soluble hydrochloride of an alkaloid for which the authors suggest the name "gelsemidine" instead of "gelseminine" which has been shown to be not a single alkaloid but a mixture of three. The last chloroformic washings yielded an amorphous brown substance which soon acquired a resinous appearance. It behaved much like Lloyd's emetidine which is believed to be a colloidal alkaloid of ipecac and the authors think it might appropriately be called "gelsemoidine." A detailed description of the alkaloids and their properties and physiological action is given.—J. Am. Pharm. Assoc. 8 (1919), 708. (Z. M. C.)

Guvacine and Guvacoline.—*Composition of.*—K. Hess finds that Merck's guvacoline is the methyl ester of guvacine. The hydrobromide, crystallized from acetone, occurs in short crystals melting at 144-145°.—Ber.; through Chem. Abstracts, 13 (1919), 591.

K. Freudenberg, studying a sample of Merck's guvacine (from betel nut), found it identical with tetrahydronicotinic acid, $\text{CH}_2\text{NHCH}_2\text{CH}_2\text{CH}=\text{CCOOH}$. He prepared a number of its derivatives.—Ber.; through Chem. Abstracts, 13 (1919), 591.

In a later paper, Freudenberg criticizes Hess' findings as to guvacine and guvacoline and confirms his own original statements

as to the formula of guvacine.—Ber.; through Chem. Abstracts, 13 (1919), 1466.

Winterstein and Weinhausen submit a short account of their experiments, fuller details being promised in a subsequent paper. They consider that guvacine is in all probability Δ^3 -tetrahydronicotinic acid, since it yields hexahydronicotinic acid when reduced by hydrogen in the presence of platinum and, when methylated, yields a product which is identical with Willstätter's arecaidine methyl betaine. Isoguvacine appears to be a simple derivative of pyrrole.—Z. physiol. Chem.; through J. Soc. Chem. Ind., 38 (1919), 232A.

Hexamethylamine.—*Decomposition of.*—P. Trelendenburg finds that the breaking down of hexamethylenamine into formaldehyde occurs in acid solutions. Slight decomposition may occur in neutral solution, but when the reaction is alkaline this is prevented. The bearing of these observations on the value of hexamethylene-tetramine for therapeutic purposes is discussed.—Biochem. Zsch.; through J. Soc. Chem. Ind., 38 (1919), 738A.

Hexamethylenamine.—*Idiosyncrasy towards.*—E. Cabannes reports a case of pronounced idiosyncrasy to hexamethylenamine, in which the patient, after a small dose of 8 grains, invariably experienced a sense of warmth in the epigastric region, with slight pain, resembling that of indigestion. Shortly afterwards this was followed by frontal headache. When the dose was increased to 30 grains the same symptoms were invariably reproduced, but were more accentuated and were followed by mental disturbance and giddiness, closely resembling drunkenness.—Rep. Pharm.; through Pharm. J., 102 (1919), 412.

Hydrastinine.—*Synthesis of.*—The technical preparation of hydrastinine suffers under the disadvantage that the initial material, homopiperonylamine, is difficult to prepare; K. W. Rosenmund describes the synthesis of certain homologues of hydrastinine from the more readily accessible methylenedioxyphenylisopropylamine and also a new method of converting homopiperonylamine into hydrastinine. Methylenedioxyphenylisopropylamine is condensed with chloromethylalcohol to methylenedioxyphenylisopropylaminomethanol, $\text{CH}_2\text{O}_2\cdot\text{C}_6\text{H}_3\cdot\text{CH}_2\cdot\text{CH}(\text{CH}_3)\cdot\text{N}(\text{CH}_2\text{OH})_2$, which, when treated with aqueous hydrochloric acid, yields 3-

methyldehydronorhydrastinine, colorless leaflets, melting point $57-58^{\circ}$; methylation of the latter with formaldehyde gives 3-methyldehydrohydrastinine, melting point $85-87^{\circ}$, which is oxidized by potassium dichromate and sulphuric acid or by iodine to 3-methylhydrastinine, melting point $107-108^{\circ}$. 1-Benzyl-3-methylhydrastinine is obtained as a yellow syrup by the action of phosphoric oxide on phenylacetylmethylenedioxyphenylisopropylamine. Homopiperonylamine reacts with chloromethyl alcohol to yield homopiperonylaminomethanol, $\text{CH}_2\text{O}_2\cdot\text{C}_6\text{H}_3\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{NH}\cdot\text{CH}_2\text{OH}$; the latter, like all members of the class, is unstable but is readily converted by warm 10 per cent. aqueous hydrochloric acid into dehydronorhydrastinine, identical with the base described by Decker.—Ber. deutsch. pharm. Ges.; through J. Soc. Chem. Ind., 38 (1919), 386A.

Hyoscyne.—*Resolution of.*—At a meeting of the Chemical Society, Harold King discussed the composition of hyoscyne, pointing out that it is the tropyl ester of an amino-alcohol, oscine. An improved method for the resolution of the acid constituent, tropic acid, by means of the two alkaloids, quinine and quinidine, was described. The basic portion, oscine, proved more refractory, but was eventually resolved into *d*- and *l*-oscines by means of tartaric acid. These results indicate the possible existence of four isomeric hyoscines, each being built up of two optically active components: *l*-tropyl *d*-oscine, *l*-tropyl *l*-oscine, *d*-tropyl *l*-oscine, *d*-tropyl *d*-oscine. By resolution of inactive hyoscines, by means of bromocamphorsulphonic acid, the hitherto unknown *dextro*-hyoscyne was isolated. This proved to be the *dextro* modification of the well-known, therapeutically valuable *levo*-hyoscyne of commerce. By recombination of these two forms, the racemic base and its salts were obtained, this synthetic method affording a guarantee of their purity. On hydrolysis *levo*-hyoscyne gave *l*-tropic acid and *inactive* oscine, the latter being invariably inactive when either bases or acids were employed for the hydrolysis. In contradistinction to this, benzoyl *d*-oscine, independent of the hydrolytic agent employed, gave optically pure *dextro*-oscine. Furthermore, the active oscines obtained by resolution of oscine were also stable to acid and alkali. These results are consistent with the representation of *d*- and *l*-hyoscines as partial racemic esters, thus: *l*-hyoscyne = *l*-tropyl *i*-oscine, *d*-hyoscyne = *d*-tropyl *i*-oscine.—Pharm. J., 102 (1919), 226.

Ipecac Alkaloids.—*Bismuth-Iodide Compounds of.*—Besides emetine, the other alkaloids of ipecac have antamebic properties also and, therefore, the whole drug or its combined alkaloids can be used in the treatment of dysentery, especially that of the amebic type. Since, however, the drug and its alkaloids are liable to produce irritation of the stomach, experiments were made to convert the alkaloids into such compounds which are not attacked by the stomach juice but are split up into the alkaloid again by the alkaline intestinal liquid. Such compounds are the bismuth-iodide double salts of the alkaloids which can be prepared according to Van der Wielen by the following process: 500 grammes of the powdered root are shaken with 3 liters of ether and 250 mls of ammonia water. The ether is decanted and the drug is shaken out with two more portions of each 1.5 liters of ether. The ether is distilled, the residue taken up in 1500 mls of 2 per cent. nitric acid and the liquid allowed to stand for 24 hours. It is then filtered and to the filtrate Dragendorff-Kraut's reagent is added until a precipitate is no longer produced. This is collected and dried at a moderate temperature. The reagent is prepared by dissolving 40 grammes of bismuth subnitrate in 100 grammes of nitric acid, diluting the solution with water to the limit of precipitation and then adding a solution of 136 grammes of potassium iodide in 175 mls of water. The mixture is allowed to stand, the liquid decanted from the potassium nitrate and diluted with 19 times its volume of one per cent. nitric acid. If some iodine should have separated this is removed by the addition of sodium thiosulphate solution.—Pharm. Weekblad, 56 (1919), 786. (H. E.)

Isopyrum Thalictroides.—*Microchemical Reactions of Alkaloid of.*—According to M. Mirande, the alkaloid, isopyrine, gives the following microchemical reactions in the plant cells: (1) With iodine in potassium iodide a granular, brown precipitate completely filling the cells, and which by the controlled action of water, alcohol, and the reagent, can be transformed into a mass of brown acicular crystals, soluble in sodium thiosulphate; (2) with picric acid, an immediate, very dense, yellow, granular precipitate; (3) with mercuric chloride, an immediate, dense, white precipitate; (4) with gold chloride or platinum chloride, a dense yellow precipitate; (5) with moderately dilute sulphuric acid, an accumulation of oily drops, which soon coalesce into one or several large masses, changing gradually into collections of grayish crystals, which

soon dissolve and are replaced by crystals of calcium sulphate; (6) with ammonia, a dense, granular, bright yellow precipitate, insoluble in water, soluble in alcohol; (7) with solutions of potassium hydroxide, potassium dichromate, or sodium molybdate, finely granular, yellowish precipitates. The alkaloid occurs principally in the subterranean organs of *Isopyrum thalictroides* and to a lesser extent in the green aerial organs.—Compt. rend.; through J. Soc. Chem. Ind., 38 (1919), 197A.

Morphine.—*Assay in Powders and Liquid Medicines.*—If a powder, mix with an equal weight of sodium bicarbonate, moisten with water, dry, extract with chloroform in a Soxhlet, weighing the morphine residue after evaporation of the chloroform. If a liquid acidulate with hydrochloric acid, make alkaline with sodium bicarbonate and shake out the morphine with chloroform.—Pharm. Ztg.; through Chem. Abstracts, 13 (1919), 1369.

Morphine and Salts.—*British Exports.*—The British exports of morphine and morphine salts expressed in ounces during the past eight years were as follows: 1911, 208,546; 1912, 276,572; 1913, 406,154; 1914, 504,020; 1915, 295,572; 1916, 225,611; 1917, 124,593; and 1918, 136,837.—Chem. and Drug., 91 (1919), 455. (K. S. B.)

Morphine.—*Color Test for.*—Morphine gives a red color with diazonium compounds in the presence of alkalis, this color changing to orange on the addition of acid. This reaction can be used for detecting and estimating morphine in forensic analysis, according to Lautenschlaeger. The liquid under examination is mixed with one mil of a 3 per cent. aqueous solution of diazobenzene sulphonic acid (diazotized sulphanilic acid) and 10 mils of concentrated sodium carbonate solution, and the color thus obtained is compared with those obtained with morphine solutions of known strengths treated in the same way. The most suitable concentration of morphine is from 0.5 to 0.05 milligramme per mil, and since the reaction is not affected by the other opium alkaloids, it can be used for detecting morphine in substances which contain only a very small percentage of the alkaloid, such as dry poppy-heads. The reaction is not given by synthetic derivatives of morphine, like dionin, heroin, peronin, etc., and, therefore, serves for distinguishing these from morphine. Of the other alkaloids only emetine, sparteine, physostigmine, coniine and nicotine give azo dyes with diazobenzene sulphonic acid.—Arch. Pharm.; through Drug. Circ., 63 (1919), 352.

Morphine.—*Detection in the Viscera.*—L. P. J. Palet prepares a paste by mixing 120 grammes of the viscera with magnesium oxide and, after drying on a water-bath, the mass is powdered, extracted with acetone (preferably in a Soxhlet apparatus), the acetone solution treated with 2 to 3 mls of water and several drops of acetic acid, after which it is filtered and the filtrate evaporated to dryness. The morphine in the evaporated residue is purified by treatment, 5 per cent. acetic acid, ammonia water and boiling chloroform. The chloroformic extract on evaporation yields a pure residue to which color tests (notably the Marquis reaction) may be applied.—*Anales soc. quim. Argentina*; through *Chem. Abstracts*, 13 (1919), 216.

Morphine and Cocaine.—*Resistance to Putrefaction.*—L. P. J. Palet describes two cases in which the presence of morphine in the viscera was demonstrated seven months and two years and six months, respectively, after death. In the former case cocaine or its decomposition products were also detected. As a test for the presence of morphine the following procedure is recommended: 100–120 grammes of the visceral pulp is warmed at 50–60° with 100 mls of water and 5 mls of sulphuric acid (1 : 4) for two hours. The liquid assumes a blood-red color which is especially marked on filter paper.—*Anal. soc. quim. Argentina*; through *J. Soc. Chem. Ind.*, 38 (1919), 438A.

Nicotine.—*Amount in Cigar Smoke.*—Recent investigations by Storm van Leuwen show that the so-called "nicotine-free" cigars, obtainable in Holland, give smoke which contains quite as much nicotine as ordinary cigars. It is also found that there is no relation between the nicotine strength of "strong" and "mild" cigars. The smoke from the latter is often quite as toxic, and contains as much, or more, nicotine than that from the former. Various expedients have from time to time been adopted to "fix" the nicotine in cigars. Tannin has been thus employed; it may render a portion of the nicotine less readily extractable by chemical solvents, but it does not prevent the appearance of the free volatile alkaloid in the smoke, on combustion. Another procedure has been to introduce ferric chloride into the butt-end of the cigar, with the object of retaining some or all of the nicotine. In cigars so treated, such as have at present been offered for sale, this also has proved a failure. Even the nicotine content of the leaf is no guide as to

the amount of the base that will be found in the smoke. The popular classification of cigars as "mild" and "strong" is probably based on factors of flavor and aroma as well as on assumed physiological results. To what constituents these are due has not yet been determined. They are not due to the nicotine content.—J. Am. Med. Assoc.; through Pharm. J., 103 (1919), 203.

Nicotine.—*Detection of.*—A few crystals of *p*-dimethylamino-benzaldehyde are dissolved on a microscope slide in a drop of hydrochloric acid and a drop of an aqueous solution of the alkaloid is placed by its side. As soon as the liquids touch each other a rose-colored band appears at the place of contact, the color changing to reddish violet and persisting for 10 to 24 hours. Coniine, pyridine and acetone give no coloration under these conditions, while anilin, in not too dilute solutions, gives a red coloration, but the coloring principle separates out immediately in long spear-shaped crystals.

Tunmann found that by this reaction as little as 0.2 milligramme of nicotine can be detected and that by it the presence of nicotine in tobacco smoke can be proven. Another very sensitive microchemical reagent for nicotine is a saturated solution of picric acid which contains 10 per cent. of hydrochloric acid and which gives with as little as 0.01 milligramme of nicotine a yellow amorphous precipitate which rapidly splits up into crystals. The crystals are colored yellow and green under crossed nicols and are not produced by aniline, coniine or dilute pyridine solutions. Pure pyridine gives similar crystals but no amorphous precipitate.—Apoth. Ztg.; through Drug. Circ., 63 (1919), 444.

Nicotine.—*Extraction from Aqueous Solutions.*—Karl Dangelmajer finds trichlorethylene a useful solvent for nicotine extractions, the yield being quantitative while the nicotine may be recovered from the trichlorethylene solution by shaking with diluted sulphuric acid.—Chem. Ztg.; through Chem. Abstracts, 13 (1919), 2958.

Nicotine.—*Optical Rotation of.*—H. Jephcott reports that nicotine purified through the nitroso compound showed sp. gr. 1.00920 at 20° 4°; $[\alpha]_D^{20} = 168.52$, and another preparation, purified through the double zinc chloride compound, showed: sp. gr. 1.00925 at 20° 4°; $[\alpha]_D^{20} = 168.61$. The same constants have been determined for aqueous solutions of nicotine over the

entire range. The sp. gr. at $20^{\circ}/4^{\circ}$ has a maximum value of 1.03990 at a concentration of 71.963 grammes per 100 mls, or 69.202 per cent by weight. The specific rotatory power falls rapidly at first on dilution and then more gradually, reaching a minimum value of 79.25 at a concentration of 6.622 grammes per 100 mls. The curve, however, is not a continuous sweep downwards, but shows a series of small rises at intervals corresponding to hydrates in molecular proportions. The sp. gr. of pure nicotine has been determined at various temperatures from 20° (1.00925) to 97.7° (0.094534). The specific rotatory power rises slightly with increase of temperature to 169.71 at 92° . Owing to the so-called closed curve of solubility of nicotine in water, the constants cannot be determined for solutions containing between 7 and 87 per cent. of nicotine at all temperatures, because separation occurs at about 60° . For concentrations just outside these limits, values have been determined at 20° and 90° , which show a strong increase of specific rotatory power at the higher temperature. The peculiar behavior of mixtures of nicotine and water is explained by the fact that nicotine is only sparingly soluble in water, and water is only sparingly soluble in nicotine, but the hydrates of nicotine are miscible with either, a state of balance existing between nicotine, its hydrates, and water.—Chem. Soc. Trans.; through J. Soc. Chem. Ind., 38 (1919), 116A. (J. F. B.)

Nicotine.—*Quality of Commercial.*—P. J. Fryer reviews the existing methods for the assay of nicotine followed by special remarks upon the refractive index as a means of estimating the amount of water present in nicotine solutions, whether the nicotine exists free or as oxalate or sulphate. The question of other possible and likely adulterants is also considered and briefly discussed.—Chem. News, 118 (1919), 297.

Novocaine-Adrenalin Stock Solution.—*Preservation of.*—J. H. Elphinstone states that this solution may be preserved by means of chloroform containing a trace of hydrochloric acid; the solution being held in a test-tube, which is kept in a glass cylinder fitted with a ground glass cover smeared with petrolatum, the chloroform being placed in the bottom of the cylinder.—Dental Cosmos; through Chem. Abstracts, 13 (1919), 1742.

Novocaine-Suprarenin Tablets.—*Assay of.*—At the request of the Red Cross, the chemists of the Laboratory of the American

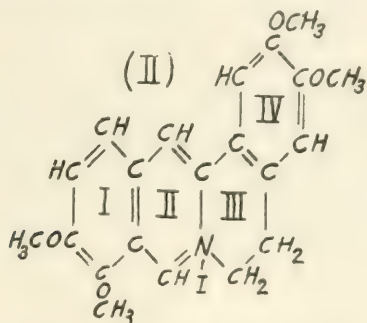
Medical Association examined samples of the above-named tablets and found variations from 25 per cent. above to 25 per cent. below amounts claimed by the manufacturers. The novocaine was determined by making an aqueous solution of the tablets alkaline with ammonia water, shaking out with chloroform, dissolving the dried chloroform extract with $N/1000$ sulphuric acid V. S., and titrating back with $N/1000$ alkali, methyl red being used as indicator. For adrenaline, Seidell's colorimetric method was modified by comparing the tint produced by manganese dioxide upon the aqueous solution of the tablet, with standards containing novocaine and adrenaline; the yellow color produced by the former affecting the hue of the adrenaline reaction.—Rep. Lab. Am. Med. Assoc.; through Chem. Abstracts, 13 (1919), 119.

Opium Alkaloids.—*Manufacture of Preparations Containing.*—Two German patents are given: (a) 500 grammes of opium are stirred well with 100 grammes of 90 per cent. formic acid for three hours until the opium is completely disintegrated. This mixture is allowed to stand over night and is then poured into 10 liters of water. The liquid is separated from the resinous matter, the filtrate mixed with an excess of slaked lime and evaporated in a vacuum. The residue is powdered, extracted with alcohol or acetic ether, the extract evaporated at moderate heat, the residue dissolved in hydrochloric acid and the solution of the salts evaporated in a vacuum. Thus a brownish powder is obtained which forms a yellowish brown, slightly acid solution. Five hundred grammes of opium assaying 12.5 per cent. of morphine yield 140 grammes of total hydrochlorides. (b) A. Stephan utilizes glycerophosphoric acid, having found that two parts of the acid (25 per cent.) dissolve one part of the combined alkaloids. The solution thus prepared is recommended for incorporation into ointments, suppositories, tooth pastes, etc.—Chem. Techn. Uebers.; through Pharm. Weekblad, 56 (1919), 982. (H. E.)

Opium Alkaloids.—*Structure of.*—M. Freund discusses the Knorr and Pschorr formulas for codeine and thebaine and suggests some modifications based on the experimental work of Freund and his pupils.—Ber. pharm. Ges.; through Chem. Abstracts, 13 (1919), 2512.

Palmatine and Columbamine.—*Structure of.*—Feist and Sandstedt continue the work of the former and his co-workers on the

structure of the alkaloids from calumba root. They decide that palmitine iodide has the structure shown in the following figure:



that, corydalin is methyltetrahydropalmitine, and report that their efforts to convert berberine into palmitine have been unsuccessful. In their investigation, the authors prepared nine derivatives of palmitine, the physical constants of which are given in the paper. They also prepared *columbamine* (*jateorrhizine*) *methyl ether bisulphate*, which upon oxidation with potassium permanganate yielded corydaline and 3,4,5-trimethoxy-orthophthalic acid, which is identical with the acid obtained from colchicine, except as to its melting point.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1453.

Pomegranate Alkaloids.—*Natural Occurrence of Isopelletierine.*

—During the preparation of large quantities of the pomegranate alkaloids, K. Hess has found that after removal of ψ -pelletierine by freezing and of the bulk of the pelletierine as the hydrobromide and subsequent distillation of the residue and treatment of the distillate with ethyl chloro-formate, a small fraction, boiling point 150–163° at 13 mm., is obtained which consists of a mixture of the urethanes of pelletierine and isopelletierine; from this, the latter can be isolated by hydrolysis with aqueous-alcoholic sodium hydroxide solution, since, under these circumstances, the pelletierine is completely resinified. The urethane of isopelletierine thus obtained forms an oil, boiling point 102–107° at 11 mm., and is identical with the product α -piperidylpropane- α -one formed by demethylation of methylisopelletierine by ethyl azodicarboxylate. The yields of the various alkaloids from 100 kilos of the bark are

approximately as follows: pelletierine, 52.5 grammes; ψ -pelletierine, 179 grammes; methylisopelletierine, 22 grammes; isopelletierine, 1.5 grammes; α -1-methylpiperidylpropane- β -one, about 1 gramme.—Ber.; through J. Soc. Chem. Ind., 38 (1919), 477A.

Procaine.—*Dental Anesthesia with.*—There is no evidence of latent injury to the dental nerves from repeated injections of procaine to control supersensitiveness of the teeth. If an isotonic solution is used and this solution made sterile by boiling, it is not probable that it will be injurious.—J. Am. Med. Assoc., 72 (1919), 1022. (W. A. P.)

Purine Bases.—*Identification in Drugs.*—O. Tunmann studied three methods of testing. Sublimation on an asbestos plate and detection with a 3 per cent. solution of gold chloride in concentrated hydrochloric acid gave serviceable results. The benzene procedure is of less value. The best is a microchemical test based upon the treatment of the powdered drug or section with ammonia water, addition of chloroform after putting the cover glass on, mixing the liquids by raising the cover glass. After a few minutes characteristic colorless acicular crystals of purine bases appear singly or in bundles. With guarana, the crystallization begins after five minutes.—Pharm. Post; through Chem. Abstracts, 13 (1919), 2960.

Pyramidon.—*New Reaction for.*—When to an acid solution of pyramidon a few drops of an acid solution of ferric chloride and potassium ferricyanide are added a deep blue color is produced and Prussian blue is precipitated, according to Palet. Antipyrine gives a blood-red color under the same conditions, the color changing to pale yellow on the addition of a few drops of hydrochloric acid. When, therefore, the reaction is carried out in the presence of hydrochloric acid, pyramidon can be detected in antipyrine, the sensitiveness of the reaction being 0.01 part of pyramidon in one part of antipyrine. The reaction does not take place with phenacetine, acetanilide, acetylsalicylic acid and caffeine.—Ann. Soc. quim. Argentina; through Drug. Circ., 63 (1919), 146.

Quinine.—*Assay of Other Alkaloids in.*—Kolthoff has found that the well-known Kerner method for estimating the by-alkaloids

in quinine and its salts gives satisfactory results only when applied to quinine sulphate; that it is absolutely unreliable when applied to quinine bisulphate, quinine hydrochloride and quinine alkaloid, especially when these products are converted into the sulphate by methods generally applied for this purpose. In these methods, which are also used in the U. S. P., inorganic salts such as sodium sulphate and sodium chloride are formed, which increase the solubility of quinine sulphate considerably. He, therefore, recommends replacing the above method by a modification of De Vrij's chromate method, and gives the following details: 0.5 gramme of quinine sulphate is boiled with 0.5 mil of $N/1$ sulphuric acid, and 20 mils of $N/2$ sodium acetate solution, and the liquid mixed with 3 mils of a 10 per cent. potassium chromate solution and kept for one-half hour at 15° ; it is then filtered, and to the filtrate a few drops of caustic soda solution are added. In the presence of as little as 1 per cent. of cinchonidine or other cinchona alkaloid a precipitate is produced. Half a gramme of quinine bisulphate is heated with 20 mils of $N/2$ sodium acetate solution until a clear liquid is obtained. After the addition of 3 mils of 10 per cent. potassium chromate solution it is treated as just given. Half a gramme of quinine alkaloid is heated with 3 mils of $N/1$ sulphuric acid and 20 mils of $N/2$ sodium acetate solution, etc. In the case of quinine hydrochloride De Vrij's method can be applied directly. —Pharm. Weckblad; through Drug. Circ., 63 (1919), 381.

Quinine.—*Detection of.*—According to H. Salomon, the fluorescence produced when a quinine solution is treated with dilute sulphuric acid is a very sensitive test and will detect 1 part of the alkaloid in 100,000 parts of solution. A less sensitive test (1 in 10,000) consists in treating the quinine with chlorine and then with ammonia, a green coloration being produced (thalleioquin reaction). It is recommended that bromine be used in place of chlorine in this test; the bromine water must be added cautiously until the solution is just colored yellow and a drop of ammonia then introduced. Another reagent for quinine recommended by Giessa and Halberkann consists of potassium iodide 10, mercuric chloride 27, water 200, and glacial acetic acid 2.5 grammes; this gives a turbidity with a solution containing 1 part of quinine in 200,000 parts. To detect quinine in urine, the alkaloid should first be extracted with ether.—Ber. dtsch. pharm. Ges.; through Pharm. Era, 52 (1919), 100.

Quinine.—*Distribution in Brazil.*—Regulations concerning the establishment of a sanitary service in Brazil for combating the destructive endemias of the rural sections have recently been promulgated by the authorities of that country. Quinine will be the principal medicine used, and will be purchased either in domestic or in foreign markets in the shape of salts of quinine. Cinchona bark will also be imported, and apparatus necessary for the extraction of the quinine salts will be installed in the Oswald Cruz Institute. When prepared, the quinine will be sold in tubes, officially sealed with a government stamp, and marked with a label indicating the quantity, quality, and official price of the salts. These tubes are to be furnished to pharmacies, and other distributors, especially throughout the malarial sections of the country, with the stipulation that they shall not be sold at a profit exceeding 10 per cent.—*Pharm. Era*, 52 (1919), 43.

Quinine.—*Elimination of.*—Valdigne and Lacaze found that quinine is retained in the organism for at least five days and that during this time it is normally eliminated from the organism both through the intestinal and urinary tracts. When administered subcutaneously some of the alkaloid adheres to the muscles and is much slower eliminated than when given by mouth, the latter administration, therefore, being preferable. If quinine is to be taken as a prophylactic it should be taken in consideration that about one-half of the dose is still present in the organism 24 hours after the administration.—*Bull. Sci. pharmacol.*; through *Drug. Circ.*, 63 (1919), 382.

Quinine.—*Intravenous Injections in Malaria.*—Leonard Rogers advocates the intravenous route for the administration of quinine in severe cases of malaria. The paper contains a record of experiments to determine the effects on the blood and the toxicity of the more common salts of quinine and cinchonine. The results are that 10 per cent. solutions of quinine may be given intravenously without any ill effect on the blood-serum, while 11 grains of the acid hydrochloride of quinine or 16 grains of the acid hydrobromide may safely be given once daily for at least four days. The hydrobromide is found not to produce as much dizziness as the hydrochloride. It will probably be desirable to supplement the intravenous doses with quinine by the mouth, as the former are likely to be more rapidly excreted through the kidneys.—*Brit. med. J.*; through *Chem. and Drug.*, 91 (1919), 39.

Quinine.—*Intravenous Use in Paludism.*—At a meeting of the Société de Biologie, Manzrols and Castel stated that they had found effective in grave cases of paludism, intravenous injections of an oil each mil of which contained 0.05 gramme of quinine, 0.10 gramme of camphor and 0.05 gramme of lipoids [source not stated]. Two mils of the oil is given at each injection.—J. pharm. chim., 20 (1919), 79.

Quinine.—*Partial Synthesis of.*—Rabe and Kindler report that quinicine (quinotoxine) and sodium hypobromite form N-bromo-quinicine, melting point 123°, which with alkali yields quinone; the latter is reduced to quinine with aluminium powder and sodium ethylate.—Ber.; through Chem. and Drug., 91 (1919), 404.

Quinine.—*Production in Java.*—The following figures show that the Javanese exports of quinine have increased 260 per cent. from 1913 to 1918:

Exported to:	1913	1916	1917	1918
Holland.....	37	29	3	..
Great Britain.....	..	..	23	51
Other European countries.....	15	14	2	14
United States.....	3	3	27	41
British India.....	5	5	12	60
Singapore.....	5	11	6	23
China.....	..	9	15	10
Philippines.....	..	8	1	6
Japan.....	5	14	25	26
Australia.....	..	3	3	4
Various countries.....	2	19	12	16

The above amounts are in metric tons.—Chem. and Drug. 19, (1919), 773. (K. S. B.)

Quinine.—*Production in India.*—During the 1917-1918 year the Government factory in Bengal produced 29,417 lbs. of quinine from 224,027 lbs. of bark (assaying 4.5 per cent. of quinine) from Mungpoo 430,066 lbs. (assaying 4.54 per cent.) from Munsong. In addition 8,158 lbs. of cinchona febrifuge, 1,261 lbs. quinoidine, 930 lbs. residual alkaloids and 50 lbs. cinchonidine were produced. The total amount of bark worked up in India was over 1,250,000 lbs., containing 4.59 per cent. of quinine, the output of which was 55,014 lbs. compared to 52,513 lbs. in the previous year.—Chem. and Drug., 91 (1919), 643. (K. S. B.)

Quinine.—*Production in Madras.*—The output of quinine from the Madras factory during the 1917–1918 year was 55,014 lbs. compared to 52,513 lbs. during the previous year. The latter, represents a 60 per cent. increase over the best previous year.—Chem. and Drug., 91 (1919), 57–58. (K. S. B.)

Quinine.—*Prophylactic Value Doubted.*—Serious doubt is thrown upon the value of the internal use of quinine, for preventing malaria, by G. Waugh Scott, a physician employed on a rubber plantation in the Malay States. The laborers on this plantation were divided into two groups, the first group consisting of tappers—strong men who do comparatively easy work—the other group being weeders, who have longer hours and do more work. Those of the first group were daily given 10 grains of quinine at a single dose, as a prophylactic. In spite of this, there actually was a lower percentage of malaria cases among the weeders, who had received no quinine whatever, this, even though they worked longer and were physically of a lower type.—Brit. Med. J.; through Drug. Circ., 63 (1919), 63.

Quinine.—*Rash Produced by.*—W. L. Somerset reports a case simulating scarlet fever which proved to be one of influenza, with a rash apparently caused by quinine. The patient, an adult male, had a temperature of 102° F., fairly intense congestion of mucous membranes of the eyes and fauces, and generally distributed erythema. This erythema was especially pronounced on the forearms and shins, but affected the face also; was purple in color and was a discoloration only, there being no evidence of dermatitis. Inquiry developed that three days before coming under observation the patient had suffered from repeated chills and had received liberal doses of quinine. On the fifth day of the disease the color of the rash was much darker and the temperature had declined to 100° F. The patient at this stage felt perfectly well in bed, but was unsteady on his legs. The diagnosis was made at this stage.—Bull. N. Y. Dept. Health; through Drug. Circ., 63 (1919), 63.

Quinine and Antimony.—*Intravenous Injections in Malaria.*—A. Patrick finds that intravenous injections of quinine check attacks of malaria, but fail to prevent relapses. Injections of antimony tartrate, on the other hand, slowly destroy the parasite and prevent relapses.—J. Roy. Army Med. Corps; through Chem. Abstracts, 13 (1919), 2714.

Quinine and Euquinine.—*Pharmacological Comparison of.*—In comparing the physiological actions on quinine and euquinine W. Sieger arrives at the conclusion that by introducing other atomic groups into the quinine molecule derivatives might be obtained which besides having the specific anti-malarial properties of quinine, might act on other microorganisms and therefore give the cinchona alkaloids a wider field of usefulness.—Pharm. Weekblad, 56 (1919), 783. (H. E.)

Quinine-Formaldehyde Solution.—*Use in War Surgery.*—The following solution is easily prepared, is stable, can be readily concentrated for transportation, the strength can be easily increased or diminished, and it can be used in an early stage of wound treatment, at the field or evacuation hospital. The formula for the solution is as follows:

Quinine sulphate.....	1.00 gramme
Acid hydrochloric.....	0.50 mil
Acid acetic (99 per cent.).....	5.00 mils
Sodium chloride.....	17.50 grammes
Liquor formaldehyde, U. S. P.....	1.00 mil
Thymol.....	0.25 gramme
Alcohol (90 per cent.).....	15.00 mils
Distilled water, to make.....	1,000.00 mils

Dissolve the quinine in the acids; dissolve the sodium chloride in the water; dissolve the thymol in the alcohol; mix the first two solutions and add to this mixture the formaldehyde solution, and then to the combined solutions add the thymol solution.

The solution is applied like the Carrel-Dakin solution.—Ann. Surg.; through J. Am. Med. Assoc., 72 (1919), 68. (J. K. T.)

Quinine and Strychnine.—*Assay in Common Solution.*—In view of the fact that chemists have found no satisfactory method for the separation of quinine and strychnine, A. R. Bliss submits a method which he has found to work well and asks for criticisms and suggestions. The method is based on the marked difference in solubility of the alkaloids in water, in ether and in chloroform. The quinine is precipitated from a large volume of an acid solution by means of ammonia water and shaken out with ether. The strychnine is removed from the ammoniacal liquid by shaking out with chloroform. Details of the method are given as well as several means of checking results. Tabulation of the results of ten estima-

tions on elixir of iron, quinine and strychnine, U. S. P. VIII, and four tests upon solutions of strychnine alone shows the method to be reasonably accurate.—J. Am. Pharm. Assoc., 8 (1919), 804. (Z. M. C.)

Solanaceous Alkaloids.—*Yield from Norwegian and Swedish Plants.*—Rustung reports on the total alkaloidal content of drugs cultivated in Scandinavia, as follows:

	Norwegian.	Swedish.
Belladonna leaves.	0.43%	.....
Henbane leaves.	0.20%	0.19 to 0.21%
Stamonium leaves.	0.18%	0.17

Landahl found that the leaves of Swedish *Datura stramonium var. inernus* yielded 0.29 per cent. of total alkaloids in 1916 and 0.39 per cent. in 1917 and that *Datura tatula* yielded 0.21 per cent. in both 1916 and 1917.—Norges Apot. Tidsk; through Chem. Abstracts, 13 (1919), 2732.

Solanine.—*Assay of.*—Dejussien criticises the method of Bellot (1914) on the basis that boiling the raw material with acidulated water will decompose the alkaloid. He gives no new method, however.—Bull. pharm. Sud-Est; through Chem. Abstracts, 13 (1919), 2252.

Sparteine Derivatives.—*Production of.*—Valeur and Luce find that treatment of 1 molecule of hydrogen iodide with 1 molecule of dioxysparteine yields an iodide with no suggestion of reduction. An excess of hydrogen iodide brings about reduction and the formation of three sparteine compounds: *Monoxysparteine periodide*, $C_{15}H_{26}N_2(OH)(I).I_2$ in crystals melting at 134° . *Sparteine periodide*, $C_{15}H_{26}N_22HI.I_2$, crystals with metallic luster, melting at 187° . *Monoxysparteine iodo-hydriodate*, $C_{15}H_{26}N_2(OH)(I).HI$, colorless crystals, sintering at 248° and melting at $256-260^\circ$.—J. pharm. chim., 19 (1919), 408.

Strychnine.—*Activation of Malaria by.*—Vecchia and Segre have noticed that a malarial attack is liable to follow a dose of strychnine, just as it follows chilling or other cause of abrupt reduction of the defensive forces. They found in Albania that men with old latent malaria had a flare-up attack when given strychnine, and that

many of them under quinine then seemed to throw off the disease permanently. In certain others, not suspected of malaria, the strychnine brought on a malarial attack. The strychnine was being given for other reasons, mostly to combat asthenia. It stimulates the tissues throughout, and the malaria bacilli seem to be driven out of the tissues by the strychnine. They are thus exposed more effectually to the action of quinine, so that it seems logical to combine strychnine with quinine in treating old rebellious cases of malaria. Their success in twenty such cases they report as particularly interesting. They say in conclusion that a few large doses of strychnine would decide the question finally whether the malaria was absolutely cured.—*Policlinico*; through *Drug. Circ.*, 63 (1919), 503.

Strychnine Sulphate.—*Incompatibility with Cacodylates.*—Neutral strychnine sulphate is widely prescribed by French physicians, and is officially recognized in the French Codex. A combination of sodium cacodylate, 50 Cgms.; strychnine sulphate, 2 or 3 Cgms.; boiled distilled water to make 10 mils, is extensively used in the form of injection. When first prepared, this is a clear solution. On keeping, however, according to E. Cabannes, a crystalline precipitate of strychnine cacodylate slowly forms and adheres persistently to the sides of the containing vessel. This is due to the sparing solubility in water, of the strychnine cacodylate formed by double decomposition. There are a number of proprietary ampuls of this injection, which, although they may contain the correct amount of the active ingredients, do not present the serious defect of depositing this dangerous salt. This is due to the employment of glycerin and alcohol in the vehicle. The following modified formula for the injection gives a solution which is permanent: Sodium cacodylate, 50 centigrammes; neutral strychnine sulphate, 2 centigrammes; alcohol, 90 per cent., 4 Gms.; glycerin, 2 Gms.; boiled distilled water, to make 10 mils. One mil, the dose for injection, will then contain 5 centigrammes of sodium cacodylate and 2 milligrammes of neutral strychnine sulphate.—*Rep. Pharm.*; through *Pharm. J.*, 103 (1919), 186.

Strychnine Sulphate.—*Incompatibility with Sodium Cacodylate and Sodium Glycerophosphate.*—Fleury and Hourvitz discuss the precipitate occurring when strychnine sulphate is dispensed in a solution of sodium cacodylate or of sodium glycerophosphate.

They find that the precipitate consists of free strychnine and they prevent the precipitation by adding to the mixture the theoretical amount of hydrochloric acid necessary to neutralize the salt employed in dispensing the prescription.—*J. pharm. chim.*, 20 (1919), 369.

Theobromine-Sodium Salicylate.—*Assay of.*—Bayer recommends for this assay dissolving 1 gramme of the sample in 10 mls of water and saturating the solution with carbon dioxide gas. The theobromine thus precipitated is collected on a tared filter washed and dried at 100° to constant weight.—*Pharm. Post*; through *Drug. Circ.*, 63 (1919), 230.

Tyramine.—*Preparation of.*—The method is based on the synthesis of *p*-hydroxybenzyl cyanide and on the reduction of this nitrile to the amine. Certain improvements in the method given, and the separation of by-products, such as *p*-cresol and *p*-hydroxyphenylacetic acid is described.—*J. Biol. Chem.*; through *J. Soc. Chem. Ind.*, 38 (1919), 962A.

Vitamine.—*Anti-Neuritic.*—According to Voegtlin and Myers, the germ or embryo of the wheat and corn kernel contains all of the anti-neuritic vitamine of these cereals. Wheat flour or corn meal containing the germ is therefore more nutritious than the correspondingly highly meal products. Consideration of the distribution of the anti-neuritic substance in the wheat and corn kernel and in the animal body, suggests that this accessory food is necessary for the metabolism of the growing plant, as well as the animal body. It appears that cells with an especially active metabolism are also rich in this anti-neuritic vitamine.—*Am. J. Pharm.*, 91 (1919), 693. (I. G.)

Vitamines.—L. Grimbirt presents an interesting summary of the work of Eykmann, Funk, Stepp, Hopkins, MacCollum and Davis, Osborne and Mendel, MacLean, Cooper, McArthur and Luckett, as well as that of other investigators, who are unfolding the significance of the presence and absence of vitamins in animal metabolism.—*J. pharm. chim.*, 19 (1919), 171 and 212.

Vitamines.—*Occurrence in Green Food.*—Osborne and Mendel state that green vegetables supply an important addition to the

human diet; because the staples, such as cereals, meats, potatoes, fats, and sugar, probably furnish a too small amount of vitamins to meet the full requirements of an adequate dietary. Therefore, care should be taken not to reduce greatly the amount of green vegetables customarily eaten, until more is learned about the actual requirements for these food factors, and their relative abundance in commonly used vegetables. Laboratory experiments show that dried spinach leaves are richer in fat-soluble vitamins than most other products. The use of 10 per cent. of the dried leaves in the diet afforded somewhat less than enough water-soluble vitamins, but was twice as effective as whole wheat, soy beans, dried eggs, and milk solids; but only about one-quarter as effective as dried yeast. Fifteen per cent. of dried cabbage was somewhat less effective than spinach. There was no deficiency in the fat-soluble accessory with either spinach or cabbage. Alfalfa, timothy grass, and clover appear to be very rich in soluble vitamins. Experiments with these latter are proceeding.—J. Biol. Chem.; through Pharm. J., 103 (1919), 186.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Anthraquinone Drugs.—*Assay of.*—Four suggested methods of assay of these drugs are: (a) spectroscopic; (b) colorimetric, without colorimeter; (c) colorimetric, with colorimeter; (d) precipitation with azonitro aniline. An anonymous writer suggests as fifth method hydrolysis of the glucosides at the temperature of boiling chloroform and weighing of the purified precipitate of oxy-methyl anthraquinones. The paper gives details of the proposed assay.—J. Pharm. Belg.; through Pharm. J., 102 (1919), 250.

Capsaicin.—*Constitution of.*—The pungent principle of capsicum was first isolated by Thresh who assigned to it the name capsaicin. Thresh, however, did not throw any light on the constitution of the substance and overlooked the presence of nitrogen, giving the formula $C_9H_{14}O_2$.

E. K. Nelson calls attention to the improved method of Micko of extracting capsaicin and says that the formula of $C_{14}H_{28}NO_3$ ascribed by Micko is impossible. His own analysis agrees with the formula $C_{18}H_{27}NO_3$. His researches indicate that capsaicin is a condensation product of vanillylamine (3-hydroxy-4-methoxybenzylamine) with decylenic acid.

The synthesis of substances leading to capsaicin is at present in process. Some of the substances thus far prepared are extremely pungent. Their description is reserved for a later communication.—J. Am. Chem. Soc., 41 (1919), 1115. (J. L. M.)

Lapworth and Royle have developed a method for the isolation of pure capsaicin from alcoholic extract of capsicum, taking advantage of the fact that it does not form a stable barium salt with ammoniacal barium chloride, and can thus be separated from the free carboxylic acids in the extract whose barium salts are insoluble in water, ether, and acetone. The pure capsaicin melted at 64–65°, and had the empirical formula, $C_{18}H_{27}O_3N$. Methylcapsaicin, melting point 74°, was prepared by methylation with dimethyl sulphate, and on treatment with phosphorus pentachloride it gave a small quantity of an oil which appeared to be the nitrile of nonoic acid. Capsaicin was but imperfectly attacked by reducing agents, giving ammonia, and in certain cases a small quantity of a compound of boiling point 216–217°, having the properties of a fatty alcohol, was isolated. Oxidation of methylcapsaicin took place readily, and veratric acid and a fatty acid, apparently nonoic acid, were recognized among the products. The authors discuss Nelson's views on the constitution of capsaicin and regard the possibility that it is built with a ring structure (such as a C-disubstituted dihydro-oxazole) as not being excluded.—Chem. Soc. Trans.; through J. Soc. Chem. Ind., 38 (1919), 843A.

Chrysoeriol.—This substance, isolated by Power and Tutin from yerba santa, is found by O. A. Oesterle to be 1,3,4-trihydroxy-3-methoxyflavone. The pure acetate melts at 215°.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1361.

Glucosidal Syntheses.—*Preparation of the Glucoside of Alpha-naphthyl Alcohol.*—Bourquelot and Bridel announce they have been able to prepare from glucose and alpha-naphthyl alcohol, $C_{10}H_7CH_2OH$, in acetone solution, a glucoside occurring in long colorless needles, slightly soluble in cold water and having the rotary power -71.02° .—J. pharm. chim., 19 (1919), 169.

Glucosidal Syntheses.—*Preparation of Gentiobiose and Two Beta-Glucosides of Glycol.*—By the interaction of emulsin (obtained from almonds) on a very concentrated solution of glucose

in glycol, Bourquelot and Bridel obtained two different glucosides: $C_6H_{11}O_5 \cdot O \cdot CH_2 - CH_2OH$ and $C_6H_{11}O_5 \cdot O \cdot CH_2 - CH_2O \cdot C_6H_{11}O_5$, the latter, a diglucoside, not having been prepared before. In addition, gentiobiose was also formed. The author concludes that the various ferments of emulsin exert simultaneously their specific synthetizing action.—J. pharm. chim.; through Chem. and Drug., 91 (1919), 1025.

Glucosidal Syntheses.—*Use of Emulsin in the Production of Cellobiose.*—Bourquelot and Bridel find that emulsin can be used in the synthesis of cellobiose as well as it can be used in the synthesis of gentiobiose.—Compt. rend.; through J. pharm. chim., 20 (1919), 136.

Glucosidal Syntheses.—*Production of Linamarin and of Glycolonitrilecelloside.*—Fischer and Anger synthesized linamarin on lines similar to those followed by Fischer and Bergmann in the syntheses of mandelonitrileglucoside and sambunigrin. Ethyl tetra-acetylglucosido- α -hydroxyisobutyrate is prepared from acetobromoglucose, ethyl α -hydroxyisobutyrate, and dry silver oxide and is converted successively into glucosido- α -hydroxyisobutyramide, tetra-acetylglucosido- α -hydroxyisobutyramide, and tetra-acetyllinamarin; the latter, when de-acetylated, yields linamarin, $C_6H_{11}O_5 \cdot O \cdot C(CH_3)_2 \cdot CN$, colorless needles, melting point $142-143^\circ$ C. (corr.), $[\alpha]_D^{18} = +29.1^\circ$ in water. Except for the somewhat higher specific rotation, the synthetic glucoside is identical with the natural linamarin isolated by Jorissen and Hairs from flaxseed and with phaseolunatin obtained by Dunstan and Henry from *Phaseolus lunatus*. The synthetic, like the natural glucoside, is slowly hydrolyzed by emulsin, more rapidly by phaseolunataase. It appears to be a β -glucoside. Since amygdalin, the most important member of the cyanogenetic glucosides appears to be the derivative of a disaccharide, the authors have attempted the synthesis of a similar substance in the manner adopted for linamarin. Thus, ethyl hepta-acetylcellosido-glycollate, $(C_2H_5O)_7 \cdot C_{12}H_{24}O_{10} \cdot O \cdot CH_2 \cdot CO_2C_2H_5$, is prepared from acetobromocellose, ethyl glycollate and dry silver oxide and is transformed successively into cellosidoglycollamide, hepta-acetyl-cellosidoglycollamide, hepta-acetylcellosidoglycollonitrile, and cellosidoglycollonitrile. $CN \cdot CH_2 \cdot O \cdot C_{12}H_{21}O_{10}$; the latter could not be obtained in the crystalline state but appears to have been prepared in an almost pure state,

since, on re-acetylation, it gave the original hepta-acetyl compound in good yield. It has $[\alpha]_D^{18} = -28.74^\circ$ in water. It was comparatively easily hydrolyzed by emulsin yielding hydrocyanic acid and dextrose.—Ber.; through J. Soc. Chem. Ind., 38 (1919), 438A.

Loroglossin.—*A New Glucoside.*—A new glucoside, loroglossine, has been discovered by Bourquelot and Bridel in *Loroglossum hirsinum*, an orchid indigenous to France.—Chem. and Drug., 91 (1919), 426. (K. S. B.)

Loroglossin.—*Properties of.*—Bourquelot and Bridel report that this glucoside crystallizes in long colorless needles; it is odorless and very bitter; very soluble in water and alcohol, very slightly soluble in acetic ether and acetone. It is levo-rotatory, does not reduce cupric liquid, and is hydrolyzed by warm dilute sulphuric acid, as well as by emulsin.—Compt. rend.; through Chem. News, 118 (1919), 204.

Santonin.—*Contamination of a Sample with Strychnine.*—The death of a child in Capetown following the use of santonin as a worm remedy resulted in the examination of the druggist's stock of santonin, which was found to contain 30 per cent. of strychnine. The powders given the child contained about $\frac{1}{2}$ grain of strychnine each. The santonin was part of the druggist's original stock, secured when he opened his business in 1914.—Chem. and Drug., 91 (1919), 5. (K. S. B.)

Santonin.—*Present Market Conditions.*—Since 1914 the conditions of santonin supply have undergone several changes, and it is common knowledge that the exclusive exportation from Russia has, during the war been in the hands of one firm only, who have been able to maintain under somewhat difficult conditions fairly regular stocks on the world's markets, and thus the demands of our Allies and our Colonies have been met. It may be recalled that there is only one factory producing santonin, and that is near Tashkent in Russian Turkestan, but it has now transpired that for several years past no wormseed has been collected, and that for fifteen consecutive months the manufacture has practically ceased. This is attributed to an acute famine which has prevailed, lack of labor and insufficient crops of wormseed. Moreover, there has been a

shortage of hydrochloric acid, used in the process of manufacturing santonin. These factors have now led up to a considerable shortage in santonin, and even when the war is finished and communications re-established, it will require at least one or two years before the Turkestan factory is enabled to resume its normal rate of production.—Pharm. Era., 52 (1919), 14.

Saponins.—*Nature of.*—Winterstein and Maxim give a preliminary account of an investigation into the nature of saponins and their hydrolytic products, the sapogenins. The saponin of the soap-berry (*Sapindus saponaria*) appears to be a mixture of glucosides which is partially hydrolyzed to a mixture of pentosides ("initial sapogenins") by cold acids and then to a compound, $C_{18}H_{28}O_3$, melting point 319° , by warm acids. This "end sapogenin" resembles the resins in many respects and gives naphthalene derivatives on oxidation.—Helv. Chim. Acta.; through J. Soc. Chem. Ind., 38 (1919), 303A.

Saponin.—*Alfalfa.*—C. A. Jacobson concludes as a result of a series of investigations he conducted that the saponin obtained from dry alfalfa hay by extraction with alcohol is very similar to other saponins as far as physical and chemical properties go, but differs somewhat in its toxicological properties. It does not hemolyze blood, whereas other saponins do. Saponins are non-nitrogenous with the exception of solanin. Alfalfa saponin is also nitrogenous and these two substances, then, constitute the connecting links between the true saponins and the alkaloids.

Alfalfa is one of the best forage crops, mainly on account of its high protein content. For this reason it would be of considerable interest to investigate these two proteins and if possible establish some definite relation which they bear to the power of the plant to abstract nitrogen from the air.—J. Am. Chem. Soc., 41 (1919), 640. (J. L. M.)

Saponin.—*Obtained from Platycodon Grandiflorum.*—H. Oshika states that the root of this plant, called kikyō in Japan and kihk-ang or kihung in China, is used as an astringent, carminative, sedative and vermifuge. He has extracted from the root a saponin, $C_{36}H_{48}O_{20}$, as a white powder difficultly soluble in water, more readily soluble in alkali and insoluble in acids, ether and chloroform. The infusion of the root is toxic to the mouse in about the same propor-

tion as senega root.—Kyoto Igaku Zasshi; through Chem. Abstracts, 13 (1919), 1331.

Saponin.—*Relative Toxicity of Quillaja.*—P. S. Pittenger finds that 15 grains of commercial saponin produced no apparent effect when administered to a 12-pound dog. Doses of 60 and 120 grains, respectively, produced vomiting after two hours, when administered to 20-pound dogs but no other untoward effects were noticed.—Proc. Penna. Pharm. Assoc., 42 (1919), 176. (R. P. F.)

Scoparin.—*Constitution of.*—Herzig and Tieing find that the formula of scoparin is $C_{22}H_{22}O_{11}$, and not as hitherto supposed, $C_{20}H_{20}O_{10}$. The authors prepared:

1. *Trimethylnorscoparin*, $C_{24}H_{28}O_{12}$, yellow crystals, melting at 260–265°.

2. *Tetramethylnorscoparin*, $C_{25}H_{30}O_{12}$, yellow crystals, melting at 220–238°.

3. *Octamethylnorscoparin*, $C_{21}H_{12}O_3(OCH_3)_8$, crystals melting at 229–233°.—Monatsh.; through Chem. Abstracts, 13 (1919), 421.

Surinamin.—*Properties of.*—E. Winterstein has studied this principle which is found in a felty network of crystals on the inner surface of the bark of *Geoffroya surinamensis*. It is identical with rhatanin, geoffroyin, angelin and andirin and is therefore N-methyltyrosin, which has been synthesized by Walpole and others. Pharmacological experiments showed it to be inactive.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 13 (1919), 3158.

Tannin.—*Synthesis of.*—Fischer and Bergmann, continuing the classic work of the former, have prepared the penta-acetyl derivatives of meta- and para-digallic acids, penta-acetyl digalloyl, penta-digalloyl-beta-glucose (closely resembling Chinese tannin), and galloyl-beta-glucose (resembling the glucogallin from Chinese rhubarb). In a second paper the authors give various manipulations necessary to bring about the synthesis.—Ber.; through J. Soc. Chem. Ind., 38 (1919), 47A and 429A.

Tannin.—*Composition of Hamamelis.*—K. Freudenberg finds that hamamelis tannin is a digalloylhexose yielding a hydrolysis with tannase, gallic acid and a levogyrate sugar, which up to now he has not been able to crystallize. It does not, however, resemble in

all of its reactions any of the sugars hitherto known.—Ber.; through J. pharm. chim., 20 (1919), 329.

Tannin.—*Mangrove as Source of.*—The Australian Advisory Council of Science and Industry has appointed a special committee to investigate the tannin contents of the different mangroves available in Queensland and the costs and commercial prospects of the industry.—Chem. and Drug., 91 (1919), 347. (K. S. B.)

Verbenalin.—*Pharmacology of.*—According to A. Holsten, this glucoside acts upon the uterus, its action resembling that of pituitrin and of the amines from ergot.—Z. Exp. Path. Ther.; through Chem. Abstracts, 13 (1919), 2088.

COLORING SUBSTANCES.

Acridlavine and Proflavine.—These are dyes derived from acridine, a base found in coal tar. Their use in medicine is proposed on the claim that they have high antiseptic power, together with comparative freedom from toxic or irritant action and without inhibiting effect on the phagocytic action of leukocytes or on the healing process. They have been used as wound antiseptics, and acridlavine has also been proposed for the treatment of gonorrhea. The reports on the value of the two preparations are contradictory and conflicting. In the treatment of wounds, solutions of 1 : 1000 in physiologic sodium chloride solution are commonly recommended. In gonorrhea, a strength of 1 : 1000 in physiologic sodium chloride solution was used for an injection into the urethra, and weaker solutions have been used for lavation.

Acridlavine.—This is 3 : 6 diamino acridine sulphate. It is a brownish red, odorless, crystalline powder, soluble in less than two parts of water and in alcohol, forming dark red solutions which fluoresce on dilution. It is nearly insoluble in ether, chloroform, liquid petrolatum, fixed oils and volatile oils.

Proflavine.—This is 3 : 6 diamino acridine sulphate. It is a reddish brown, crystalline powder. It is soluble in water and alcohol, forming brownish solutions which fluoresce on dilution. It is nearly insoluble in ether, chloroform, liquid petrolatum, fixed oils and volatile oils.—J. Am. Med. Assoc., 73 (1919), 1443 (W. A. P.)

In another article, it is pointed out that the use of the dyes is in the experimental stage and that their value cannot be definitely judged. Of the thirty-four reports which are abstracted, twenty-five may be considered as favorable; seven are distinctly unfavorable and two are in the doubtful class.—J. Am. Med. Assoc., 73 (1919), 1542. (W. A. P.)

Acridflavine.—*Use in Gonorrhea.*—Davis and Ibarrell find that owing to its diffusibility acridflavine penetrates the mucosa of the urethra and bladder, and that it is antiseptic in urine in higher dilutions than any other diffusible dye studied; that it inhibits the development of the gonococcus in culture in a dilution of at least 1 : 300,000. Urethral injections of concentrated acridflavine cause slight smarting, which persists for an hour or more, but patients previously treated with protargol—a far less powerful antiseptic—say that acridflavine is decidedly less irritating. The most satisfactory concentration was found to be 1 : 1000, no complication has followed the use of this concentration, and the smarting is negligible. When the anterior urethra is affected, about 3 mls of 1 : 1000 solution are injected, and retained for five minutes. In cases with posterior affection, 15 to 30 mls are injected through into the bladder. Injections should be given twice daily until all organisms have disappeared from the discharge, and then once a day until the patient is considered well. In the majority of cases the organisms disappeared after two or three injections.—Brit. Med. J.; through Chem. and Drug., 91 (1919), 483.

Flavine.—*Keeping Qualities of Solutions of.*—A. Abelmann finds that this dyestuff (3,6-diamino-acridine) is extremely sensitive to sunlight in 1 per cent. solution, turning brown and developing a growth of *Autonomyces*. One per cent. solutions keep perfectly well in the dark, being considerably more stable than 0.1 per cent. solutions. The addition of acetic or citric acids or of hydrogen dioxide produces the brown color even in the dark.—Pharm. Ztg.; through Pract. Drug., July, 1919, 36.

Anthocyanin.—*Use as an Indicator.*—Harrow and Gies find that this plant pigment, obtained from tulips by the Willstätter method, is a sensitive indicator in acidimetry, being green in acid solution and red in alkaline solution.—Proc. Soc. Exp. Biol. Med.; through Chem. Abstracts, 13 (1919), 2695.

Clitoria.—*A New Indicator.*—Babe and Cabrera give this name to an indicator made by extracting with 95 per cent. alcohol the coloring matter from the flowers of a double blue variety of butterfly pea, *Clitoria ternatea*. This was found to be superior to phenolphthalein for detecting minute adulterations of milk with potash solutions. It was also found to be superior to phenolphthalein and tincture of cochineal as an indicator in some other reactions.—*Revista. Agric. Comm. Trab.*, 2 (1919), 537. (Bot. Abstracts).

Curcumin.—*Structure of.*—An extended study of the condensation products of curcumin with benzaldehyde and nitrosodimethylaniline and also of the bromo-derivatives of curcumin and its derivatives has led P. C. Ghosh to assign a formula to curcumin identical with that suggested by Milobendzki, Kostanecki, and Lampe, and subsequently confirmed by Lampe. It is shown that the acetyl derivative prepared by Jackson by the action of acetic anhydride and sodium acetate on curcumin is, in reality, diacetyl-isocurcumin and that isocurcumin can be obtained from it by deacetylation by sulphuric acid in acetic acid solution. Heller's suggestion that curcumin and iso-curcumin are geometrical isomerides thus receives confirmation.—*Chem. Soc. Trans.*; through *J. Soc. Chem. Ind.*, 38 (1919), 354A.

Eosins and Erythrosins.—*Examination of.*—The examination of eosins and erythrosins is discussed in an article by T. Tusting Cocking, James D. Kettle and E. J. Chappel. A preliminary, qualitative examination, to determine whether or not two halogens are present, is first made. The percentages are then calculated as follows: Dissolve 2 grammes of the sample in water, if necessary, adding a small quantity of halogen-free sodium hydroxide to render clear. If still hazy, the presence of ethyl-eosin may be suspected. Add a slight excess of dilute sulphuric acid and warm until the precipitated dye-acid becomes granular. Cool, collect the precipitate on paper in a Gooch crucible, and wash once with dilute sulphuric acid, reserving the filtrate. Continue washing with dilute hydrochloric acid until the sulphuric acid is removed. The weight of the precipitate, dried at 120°, gives the amount of dye-acid present in the sample. An excess of N/10 silver nitrate and nitric acid are added to the reserved filtrate, any precipitate silver halide filtered off, washed, dried, and weighed, and the excess of silver in the filtrate determined by titration with ammonium thio-

cyanate. The percentages of halogens present in inorganic combinations as diluents and impurities are calculated from the following formulas: x = no. of mls of N/AgNO required; y = weight of silver halide in grammes; a = weight of substance taken.

$$1. \text{ Mixtures of chloride and bromide: } \frac{1.4978x - 79.75y}{a} = \% \text{Cl.}$$

$$\frac{179.74y - 2.5776x}{a} = \% \text{Br.}$$

$$2. \text{ Mixtures of chlorine and iodine: } \frac{0.9104x - 38.77y}{a} = \% \text{Cl.}$$

$$\frac{138.78y - 1.989x}{a} = \% \text{I.}$$

$$3. \text{ Mixtures of bromine and iodine: } \frac{3.992x - 170.04y}{a} = \% \text{Br.}$$

$$\frac{270.08y - 5.072x}{a} = \% \text{I.}$$

The purity of the precipitated dye-acid obtained in the above estimation is determined as follows: Weigh 0.5 gramme into a very small porcelain crucible, mix intimately with a small amount of anhydrous sodium carbonate, fill brimfull of sodium carbonate, place a larger crucible over it, upside down, and quickly invert the two. Completely cover the small crucible with sodium carbonate and heat over a brisk flame for half an hour. Cool, dissolve the melt in water, and filter. In case of the iodo-derivatives, add a few crystals of sodium sulphate to insure reduction of any iodate. Add an excess of N/10 silver nitrate and nitric acid, filter off the silver halide, wash, dry, and weigh. The excess silver in the filtrate is then determined as before by Volhard's method.—Chem. and Drug., 91 (1919), 826-7. (K. S. B.)

Nigrosin.—*Toxicity of.*—P. S. Pittenger reports a commercial sample of water-soluble nigrosin was administered, by mouth, to dogs weighing about 20 pounds in doses as high as 120 grains with apparently no physiological effects. The exact chemical nature of the nigrosin was not determined. It was free from arsenic and other heavy metals.—Proc. Penna. Pharm. Assoc., 42 (1919), 177. (R. P. F.)

Toluidine Blue.—*Use as Diphtheria Stain.*—Sutherland prepares the staining fluid by dissolving 0.1 gramme toluidine blue in

0.5 mil of glacial acetic acid and 100 mils of water. Slides stained with this fluid show the polar granules of *Bacillus diphtheriæ* a deep reddish purple, while the bodies of the bacilli are faintly blue. Most other organisms, including Hoffman's bacillus, are more faintly stained.—*Lancet*; through *Am. J. Pharm.*, 91 (1919), 312.

ALBUMINOIDS.

Proteins.—*Action of Chloramines on.*—J. F. Briggs says that the use of hypochlorous acid in antiseptic surgery in recent times indicates the need for a clear exposition of the chemical functions of the chloramines generally and of the chloramine derivatives of the proteins in particular. He says that all kinds of protein derivatives give the chloramine reaction regardless of their state of complexity and solubility. Protein colloids like silk and wool combine with the halogen without entering into solution, aqueous solution of gelatin is precipitated in the form of an insoluble chloramine, and peptones, albumoses and simple amino derivatives give chloramine compounds which are soluble in their respective degrees. All this is worth recalling and helps to explain the physiological action of chlorine as applied to surgery.—*Am. J. Pharm.*, 91 (1919), 170. (J. K. T.)

Egg Albumen.—*Vacuum Distillation Products from.*—Pictet and Cramer heated 4 kilogrammes of egg albumen under 22 milligrammes pressure. Up to 70° nothing but water (30 per cent.), containing organic matter (6 per cent.), is obtained; at 150° considerable gas is evolved; at 220° a yellow oil (9 per cent.) passes over; at 350° the distillation ceases and there remains in the retort a light and porous cake (32 per cent.).

The organic matter in the water consists chiefly of acetic, propionic, normal butyric and succinic acids and aromatic acids. From the oil is obtained an amine, C_6H_9N , which is presumably dihydro-aniline, and an isohexamide, $(CH_3)_2CHCH_2CH_2CONH_2$. The authors explain the formation of the latter from leucin.—*Helv. Chim. Acta*; through *J. pharm. chim.*, 20 (1919), 282.

Gelatin.—*Determination of Zinc and Copper in.*—The following method has been proposed for the determination of zinc and copper in gelatin by George S. Jamieson, which he claims obviates the disadvantage of completely destroying the organic matter.

Samples of gelatin weighing 20 to 50 grammes are treated in beakers, with 100 mls of water and with 15 to 30 mls of hydrochloric acid, and are digested on steam-bath for 1 to 2 hours. After hydrolysis is completed, the solution is rendered slightly alkaline with ammonia and allowed to cool to about 40°, hydrogen sulphide gas is passed in until all the copper and zinc is completely precipitated, allowed to settle and filtered. The precipitate after washing with a very dilute ammonium sulphide solution is dissolved in 1 : 1 hot nitric acid and evaporated with 10 mls of 1 : 3 sulphuric acid until all nitric acid is expelled, is filtered if necessary and is diluted to about 100 mls. Then pass in more hydrogen sulphide gas to precipitate copper, filter into Gooch crucible, wash and ignite to copper oxide, cool, and weigh.

The filtrate containing the zinc is heated to expel hydrogen sulphide, is made ammoniacal with ammonia, 15 mls of 50 per cent. formic acid added, the zinc precipitated as the sulphide, filtered, washed and ignited to zinc oxide. Analytical data given indicate good results by above method.—J. Ind. Eng. Chem., 11 (1919), 323. (L. A. B.)

Lipase.—*Action of Alcohol and Acetone on.*—Kita and Osumi find that while ethyl alcohol destroys the activity of lipase, acetone has no action whatever upon its activity.—J. Tokyo Chem. Soc.; through J. pharm. chim., 19 (1919), 45.

Oxydases.—*Preservation of.*—H. Hérissé describes methods employed by Bourquelot and his co-workers in preserving oxidizing enzymes. The enzyme of *Russula delica* macerated in glycerin, prepared 20 years ago, was kept in the laboratory still, shows remarkable activity and the juices with or without glycerin, kept in well-filled, sealed bottles for 14 or 15 years, are still active.—J. pharm. chim., 20 (1919), 72.

Pancreatin.—*Action in the Presence of Pepsin.*—Pepsin destroys the action of pancreatin taken into the stomach according to experiments conducted and described by W. G. Toplis. He states it is altogether improbable that the ordinary method of administering pancreatin, in extemporaneous prescriptions, ever succeeds in delivering unchanged pancreatin into the duodenum. "If pancreatin ever performs any digestive service, when taken, unprotected, in the stomach, it occurs within the first ten minutes

thereafter and is concerned principally with the conversion of starch by amylopsin into maltose before the stomach has acquired a marked degree of acidity."—Proc. Penna. Pharm. Assoc., 42 (1919), 273. (R. P. F.)

Pepsin.—*Chemical Changes in.*—Louis Davis and Harvey M. Merker discussing the question of the chemical composition of pepsin conclude that the purification of pepsin seems to consist in the elimination of secondary protein derivatives including α -amino acids.

Calcium and sulphur appear to be unaltered as a result of purification, but phosphorus is materially reduced.

Aqueous solutions of pepsin, after purification, show no material change in optical activity, a sample of high digestive power (1 : 40,000) shows a reaction very nearly neutral.

Pepsin tends to approach nearer to the actual character of a protein (possibly a glycoprotein) with increasing protolytic action.—J. Am. Chem. Soc., 41 (1919), 221. (J. L. M.)

Pepsin.—*Examination of Old Preparations of.*—L. E. Warren had occasion to examine some very old preparations containing pepsin. One thirty-nine years old showed 28.8 per cent. of ash, one ten years old gave 4.14 per cent. of ash and a 1919 product, 3.01 per cent. Test of proteolytic activity showed the same specimens to be, respectively, 1-500, 1-2500 and 1-2000. It seems noteworthy that a specimen thirty-nine years old should retain any proteolytic activity.—J. Am. Pharm. Assoc., 8 (1919), 734. (Z. M. C.)

Pepsin.—*Value of Commercial Preparations of.*—Thirteen samples of pepsin wine from various sources were examined by O. Gross and all found to be almost or entirely devoid of peptic activity. This inactivity may be due either to a weakening of the strength of the pepsin by the wine itself or to a gradual loss of activity of the dissolved pepsin. The amount of loss is dependent on age and storage temperature. In an experiment with a fresh wine made by the author, part of which was kept in cold storage, the other at normal (room) temperature, the loss in the former case was from 30 units per mil to 15 units in 30 days and 6 units in 2 months, and in the latter case to 4 units and zero, respectively. Other pepsin preparations examined also showed in nearly all cases very little peptic activity.—Dtsch. med. Wsch.; through J. Soc. Chem. Ind., 38 (1919), 876A.

Peptone.—*Use in Migraine.*—Pagnez, Pasteur, Radot and Nast have found that in persons suffering from migraine of long standing, and uninfluenced by all therapeutic agents, the administration of 0.5 gramme of peptone one hour before each meal, for a period of ten days, caused a definite improvement, resulting in a cure lasting several months. They believe that zinc medication is successful in cases where the migraine is probably the prece to an anaphylactic manifestation of the organism towards albuminoid foods, similar to strawberry and lobster urticaria.—*Presse med.*; through *Chem. and Drug.*, 91 (1919), 1121.

Rennets.—*Animal and Vegetable.*—A description is given of the sources, methods of cleaning, industrial preparation, determination of coagulating power and uses of both animal and vegetable rennets.—*Sci. Am. Supp.*; through *J. Am. Pharm. Assoc.*, 8 (1919), 559. (H. H. S.)

Trypsin.—*Purification of It and Other Enzymes.*—J. T. Wood calls attention to some work carried out by Robertson, who found that when one drop of a saturated solution of safranine is added to 5 or 10 mls of neutral, or very faintly alkaline, 0.5 per cent. solution of Grubler's trypsin, a light, flocculent, colored precipitate slowly appears and gradually settles. Wood, working with one of his own trypsin preparations, which was relatively free from albuminous matter, was surprised to find that no precipitate was formed, *i. e.*, the ordinary preparations of trypsin, and aqueous extracts of pancreas, gave precipitates, but the purified preparation (the strength of which was equal to that of the crude preparation) gave no precipitate. It appears then that the matter precipitated by safranine is an albuminous compound, which carries the enzyme down with it, and that the precipitation by this method does not produce an enzyme-safranine compound.—*Am. J. Pharm.*, 91(1919), 173. (J. K. T.)

SERA AND VACCINES.

Autogenous Vaccines.—*Formulas for Standardizing.*—L. R. Tehon presents his method of lessening the tediousness of calculating by the Wright method. He gives a table of formulas whereby the labor of calculating dilutions is much lessened. For details, the original paper should be consulted.—*Am. J. Pharm.*, 91 (1919), 807.

Sera and Vaccines.—*Desiccation and Preservation of.*—F. Bordas states that if vaccines are dried *in vacuo* at a low temperature, not exceeding -80° , and are then packed in absolutely vacuum tubes, it is found that they will retain their activity for prolonged periods, and may be transported to and kept in the tropics without deterioration until the containers are opened. For this purpose small Arsonval-Dewar tubes, capable of containing 5, 10, or 15 grammes of the dry material, are employed. By this means vaccines, sera, and similar preparations may be safely exported to hot countries, where the temperature in the sun rises to 55° and will retain their activity for several years. This method, therefore, affords an efficacious and economical means of maintaining a full supply of active vaccines in tropical colonial inoculation centers.—*Compt. rend.*; through *Pharm. J.*, 103 (1919), 434.

Serums.—*Sugared.*—G. Lyon describes the sugared serum introduced into therapeutics at the Montpellier School of Medicine in 1899, the subject being investigated by Hédon, Arrous, Jeanbreaux and Fleig. The article gives Fleig's recipes for isotonic and hypertonic sugared serums.—*Presse med.*; through *Chem. Abstracts*, 13 (1919), 1370.

Lactic Acid Ferments.—Fermented milks have long been used because they were palatable to many or because of an opinion among the laity and among physicians that they were advantageous in certain disorders of the gastro-intestinal tract. A great stimulus to the employment of fermented milk was given by the theories of Metchnikoff regarding intestinal putrefaction, which are, however, entirely unsupported by scientific evidence. No one seriously subscribes to his opinions at the present time, but, on the other hand, there is evidence that the administration of sour milk products is at times beneficial. In pediatrics, fermented milk has found a wide application. By the use of acid-producing bacteria, milks of suitable composition may readily be prepared. For this purpose, bacteria of the Bulgarian bacillus group, usually in association with *Streptococcus lacticus*, have been found particularly satisfactory. There is little evidence showing that organisms of the Bulgarian group can be implanted in the intestinal tract. There is little evidence that liquid cultures of lactic acid organisms are of value as local application to mucous membranes or in arresting putrefaction or suppuration in wounds, abscesses or sinuses. Liquid cultures of

lactic acid organisms, and still more the tablets, deteriorate with age. All such preparations must be stored in an ice-chest and should be marked with an expiration date after which they are not to be used.—J. Am. Med. Assoc., 73 (1919), 1887. (W. A. P.)

In a second paper, mention is made of an investigation made by a committee appointed by the Council on Pharmacy and Chemistry, which studied the problem with the aid of a large number of bacteriologists, clinicians and manufacturers. This study showed that the bacteriologists and scientific laboratory workers show far less enthusiasm for the claims of lactic acid bacteria for a place in practical therapy than do the clinicians. It was the general opinion that the Bulgarian bacilli cannot be effectively implanted in the alimentary canal by feeding cultures thereof. The overwhelming preponderance was against the usefulness of cultures of the bacilli in infected sinuses, cavities, etc. The committee recommended that cultures of *Bacillus acidophyllus* be not included in New and Non-Official Remedies at present. The committee considers it important that the Council should continue its control of the viability and purity of cultures offered for sale.—J. Am. Med. Assoc., 73 (1919), 1895. (W. A. P.)

Lactic Bacilli.—*Starch an Indispensable Complement to.*—E. Doumer points out that the lactic ferments have not proved of success in intestinal troubles mainly because the bacilli require starch as food and ordinarily starch taken as food or medicine rarely reaches the large intestine unchanged. He makes this possible by administering to his patients starch protected by paraffin, which should have the melting point of 45°. This he dissolves in an appropriate solvent (presumably ether) and pours this on the powdered starch and shakes the mixture in a closed container until thoroughly mixed. Then the mixture is dried at room temperature. His finished product contains 1 part of paraffin to 5 of starch and this he administers in doses of 25 grammes twice a day along with the lactic ferment.—Gaz. hopitaux; through J. pharm. chim., 20 (1919), 188.

Phylacogens.—A circular letter devoted to singing the praises of "Pneumonia Phylacogen" contains this: "Pneumonia Phylacogen has been found to be a dependable means of preventing and treating pneumonia complications of influenza. In one large city it

became a routine measure to give all persons affected with influenza an injection of pneumonia phylacogen as a prophylactic of pneumonia. The results were remarkable. Not only did the cases improve rapidly but in a majority of them the pneumonia did not occur." The injection of phylacogens is simply the administration of a mixture of the filtered products of several bacterial species. The results that follow represent the reaction of the bacterial proteins—a reaction for good or evil. There is no scientific evidence to show that they possess any specific prophylactic virtue. To recommend their use in patients with influenza, as a prophylactic against pneumonia, is unwarranted; and the physician who acts on the advice of the manufacturer must assume the responsibility of the results. In case of mishap, he cannot fall back on the manufacturer. He will find no scientific evidence to support him.—J. Am. Med. Assoc., 73 (1919), 1442. (W. A. P.)

Rabies.—*Victory over.*—Amid the victories on the European battlefield, we may pause to contemplate man's conquest of rabies. During the year 1916, 1,008 persons in the district of Lyons received the antirabic treatment. A single death in this list places the mortality at 0.099 per cent. Since 1900, more than 9,000 persons have received antirabic inoculations, with a total of nine deaths, or 0.09 per cent.—J. Am. Med. Assoc., 72 (1919), 800. (W. A. P.)

Tuberculosis.—*Skin Tests for.*—J. W. Allan states that after considerable experience in the application of the Moro and the von Pirquet skin tests, he decides that they are, on the whole, helpful aids to diagnosis, with the additional advantage that they can be used without fear of doing harm. He also adds that in the presence of a positive reaction, conclusion may be drawn that the patient actually is affected with tubercle though not necessarily active.—Am. J. Pharm., 91 (1919), 759. (I. G.)

Vaccines.—*Use in Influenza.*—The efficiency of vaccines in preventing influenza or of preventing or decreasing the severity of secondary infections is unproved. In view of the varying preponderance of the different organisms isolated from influenza cases, it is evident that even if a certain mixture is found efficacious in one locality, it may not be effective in another. Thus far, hope and imagination have exceeded scientifically controlled facts. Many vaccines come highly recommended by their manufacturers;

but very little dependable evidence is submitted to show how much, if at all, the patient will profit therefrom.—J. Am. Med. Assoc., 73 (1919), 1544. (W. A. P.)

According to C. Cépède, three species of normally saprophytic microbes, *Pneumococcus*, *Enterococcus*, and *Streptococcus*, from various sources, are cultivated in a gelose-broth peptone medium for 24 hours in a Roux box, the culture medium being in the lower part. The next day the boxes are turned over, the gelose being below. Thus the surface dries slightly, and the organisms adhere to it. At the end of the second day a first washing removes the exotoxines. A second washing, with maceration and brisk agitation, detaches the colonies, which are immediately killed by boiling for 30 minutes. After standardization to 100,000,000, the vaccine is put up in ampuls. The minimum dose is 1 mil. This is the usual dose for infants, and may be greatly exceeded without harm. In grave cases as much as 6 mils in 24 hours in successive doses of 1 mil has resulted in a cure. The vaccine is more rapidly efficacious when it is administered early in the attack. The patient must have strength sufficient to react to the treatment.—Compt. rend.; through Pharm. J., 102 (1919), 426.

Wassermann Reaction.—L. Bory proposes to change the name of this reaction to the "sigma" reaction. Josué prefers that it be called the "Bordet" reaction.—Compt. rend. soc. biol.; through Chem. Abstracts, 13 (1919), 974.

URINE, BILE, BLOOD, ETC.

Urine.—*Nephelometric Assay of Acetone in.*—G. Issoglio employs the following method: One hundred mils of urine are mixed with 50 mils of water and the mixture is then distilled until 100 mils of distillate are obtained. Ten mils of this are mixed with 10 mils of 5 per cent. solution of soda and 30 mils of compound solution of iodine (5% I : 10% KI). The resulting turbidity due to formation of iodoform is compared with the turbidity produced in acetone solutions of known strength.—Giorn. farm. chim.; through J. pharm. chim., 20 (1919), 258.

Urine.—*Detection of Acidosis.*—C. Mitchell diagnoses acidosis by the following urinary test, which he finds preferable to the Gerhardt ferric chloride reaction. Add to 145 mils of water, 3 mils of Lugol's solution and 2 mils of saturated solution of picric acid.

The latter, while not indispensable, adds to the sharpness of the test. The mixture placed in a porcelain capsule is heated until vapors arise but not to the boiling point. While hot, the sample of urine is run in from a burette until the fluid becomes decolorized. In grave cases of acidosis, 2 to 3 mls of urine are sufficient to decolorize, while in normal urine as much as 50 mls are necessary. The abstract closes with details by G. Meillère as to how the Gerhardt ferric chloride test should be conducted.—*Med. Rec.*; through *J. pharm. chim.*, 20 (1919), 31.

Urine.—*Albumin Assay with Phosphomolybdic Reagent.*—Lilienthal-Petersen employs the Esbach precipitation method with the replacing of picric acid solution as precipitant by a solution made from phosphomolybdic acid, 2 grammes; concentrated sulphuric acid, 6 grammes; kaolin, 6 grammes; water to make, 400 grammes. The precipitation is complete at the end of 6 hours.—*Ugeskrift f. Læger*; through *Chem. Abstracts*, 13 (1919), 3205.

Urine.—*Differentiation of Albumins in.*—A. C. Hollande continuing his work on rabbit serum containing precipitins, as a reagent for albumin in urine (see *YEAR BOOK*, 1917, 481), points out that the presence of other proteids sometimes interferes with the test. He therefore recommends that the sample of urine be saturated with ammonium sulphate, that the precipitate be collected on a plain filter and washed with saturated ammonium sulphate solution, that the precipitate be dried and that then the precipitate be dissolved in normal saline solution and used for the serum test. He also recommends that the serum be added to a blank test made by washing a plain filter with saturated ammonium sulphate solution and then passing normal saline through the filter, the saline filtrate being used for the blank test. If this blank test with the serum shows the faintest suggestion of clouding, that particular sample of serum should be rejected.

Hollande's recent work leads him to the belief that if the several forms of protein found in pathological urine be isolated and injected into rabbits, the serum obtained can be used as a precipitin test for the particular protein in question.—*Compt. rend. soc. biol.*; through *J. pharm. chim.*, 20 (1919), 92 and 94.

Urine.—*Assay of Arsenic in.*—W. van Rijn gives an interesting review of the various methods offered for estimating arsenic in urine.

I. One liter of urine is evaporated to 100 mls, the residue mixed with 100 mls of concentrated hydrochloric acid and the mixture heated in a flask provided with a reflux condenser on a water-bath, adding potassium chlorate until the organic matter is destroyed. The chlorine is then driven off by a current of air and into the liquid pure sulphuretted hydrogen gas is conducted. After allowing the mixture to stand for 24 hours, the arsenic sulphide is collected on a filter, washed and dried. Filter and precipitate are then fused with a mixture of equal parts of potassium nitrate and anhydrous sodium carbonate, the residue is heated with pure sulphuric acid until the nitric acid is expelled and the solution is transferred to a Bloemendaal apparatus which is a modification of a Marsh apparatus. The arsenic which is deposited in the form of a mirror is then estimated with volumetric potassium dichromate solution in the usual way.

II. To the liquid in which the organic matter has been destroyed and which has been made alkaline with ammonia water 10 mls of magnesia mixture and 5 mls of diluted sodium-phosphate solution are added. The mixture is allowed to stand for 24 hours, the precipitate is collected on a filter, washed with 2.5 per cent. ammonia water and incinerated. The residue is taken up in diluted sulphuric acid, the solution transferred to a Bloemendaal apparatus, etc.

III. One liter of urine is acidulated with 10 mls of diluted sulphuric acid and to the mixture 50 mls of a 10 per cent. bromine-potassium bromide solution are added. The mixture is allowed to stand for 12 hours, the arsenic acid is precipitated with 200 mls of magnesia mixture and the precipitate treated as under II.

IV. One liter of urine is mixed with 200 mls of lime water, the mixture evaporated and the residue incinerated. The ash is extracted with 20 mls of diluted sulphuric acid and after cooling the solution is filtered. The filtrate is mixed with one ml of a 10 per cent. potassium meta-bisulphite solution, the liquid evaporated to about 10 mls, transferred to a Bloemendaal apparatus, etc.

V. One liter of urine is evaporated, the residue heated with concentrated sulphuric acid and concentrated nitric acid is added until the liquid has become colorless. After expelling the nitric acid by heating, the liquid is transferred to a Bloemendaal apparatus, etc.

VI. This method, originated by Paucke, depends on the adsorption of arsenic by ferric hydroxide. The organic matter of the urine is destroyed in the usual way, the liquid evaporated in

the presence of potassium nitrate and the residue transferred to a molten mixture of potassium and sodium nitrate. The melt is dissolved in water, mixed with a sufficient quantity of ferric alum solution and then ammonia water is added until the iron is precipitated. The precipitate is collected on a filter, washed well and is dissolved in diluted sulphuric acid. The acid solution is transferred to the Bloemendaal apparatus, etc. The last-named method gives very accurate results, the error in the presence of 40 to 100 mgm. of arsenic being not greater than 1 to 2 per cent., and with smaller quantities of the metalloid at most 5 per cent.

The writer further found that by comparing the arsenic mirrors obtained in the analysis with those obtained with arsenic solutions of known strengths erroneous results are liable to be obtained. The same is the case when weighing the residues with a micro-balance.—Pharm. Weekblad, 56 (1919), 1072. (H. E.)

Urine.—*Test for Bile Pigments in.*—Farmachidis states that methylene blue shows the presence of bile pigments in the urine, by a change in tint to a grass-green, on addition of 5 drops of a 1 per cent. solution of the blue to about 5 mls of the urine. If there is only urobilin present, the tint is more of an emerald-green. With other substances in the urine the tint remains the unmodified blue.—Gaz. Ospedal.; through Drug Circ., 63 (1919), 64.

Urine.—*Detection of Bilirubin in.*—E. Klasten adds to 5 mls of urine, 5 drops of 1 per cent. methylene blue solution, when a green color is produced, becoming intensely blue on addition of 2 to 3 drops of a 1 per cent. permanganate solution.—Wien. klin. Wsch.; through Chem. Abstracts, 13 (1919), 2687.

Urine.—*Detection of Blood in.*—Fuld is able to detect blood in a dilution of 1 in 10,000,000 by the red color produced by the following reagent:

Dissolve 0.2 gramme of rhodamine in 50 mls of alcohol and decolorize the fluid by boiling with 5 grammes of zinc dust and 4 mls of 10 per cent. sodium hydroxide solution.—Pharm. Zentralh.; through Chem. Abstracts, 13 (1919), 330.

Urine.—*Presence of Chitenine in.*—Nierenstein confirms Kerner's statement that a decomposition product of quinine found in the urine is chitenine. This substance Nierenstein obtained as

prisms melting at 281° and has the optical activity $\alpha_D = -122.6^{\circ}$.—J. Roy Army Med. Corps; through J. pharm. chim., 20 (1919), 286.

Urine.—*Assay of Glucose with a Modified Fehling Solution.*—F. Klein gives the results of determinations of sugar in urine by the use of a modified Fehling's Solution.

One bottle "Fehling Solution Klein" is prepared by using 1 part of Fehling's solution U. S. P. IX and 4 parts of 50 per cent. potassium or sodium sulfocyanate. This solution will keep indefinitely, and is, therefore, more stable than common Fehling's solution.—Pract. Drug., Sept., 1919, 25. (H. H. S.)

Justin-Mueller recommends replacing Fehling's solution by a reagent prepared by adding 20 mls of a 10 per cent. copper sulphate gradually to 100 mls of a 33.69 per cent. solution of sodium hydroxide. This solution remains clear indefinitely and does not give a precipitate of cuprous oxide on boiling.—J. pharm. chim.; through Drug. Circ., 63 (1919), 381.

Urine.—*Detection of Glucose in.*—Normal urine is liable to contain traces of glucose and Fehling's test as generally applied is liable to give erroneous results. Ruoss, therefore, suggests the following test: Two mls of Fehling's solution are mixed with 5 mls of urine and after the addition of a few pieces of quartz, the mixture is boiled for 15 seconds. If, after the addition of 20 to 25 drops of acetic acid and 2 to 3 drops of potassium ferrocyanide solution, no red copper ferrocyanide is formed, only traces of glucose, which are not abnormal, are present. When, however, no copper ferrocyanide is produced when treating only 3.5 mls of urine in the same way, the urine is diabetic.—Z. anal. Chem.; through Pharm. Weekblad, 56 (1919), 985. (H. E.)

Urine.—*Sensitiveness of Various Glucose Reagents.*—George E. Fève comes to the following conclusion after an exhaustive study of the action of Nylander's reagent, Fehling's reagent, and phenylhydrazine in the detection of dextrose in urine. First, that Nylander's test is not of much value for the testing of solutions containing less than 0.5 per cent. of dextrose. Second, Fehling's solution is the most sensitive, showing positive reaction with a solution containing $1/800$ part of one per cent. of dextrose.

Third, that the phenylhydrazine test is highly sensitive, showing positive reaction with a 1/400 of one per cent. dextrose solution, after allowing the test to cool and stand for nearly two hours.—*Am. J. Pharm.*, 91 (1919), 717. (I. G.)

Urine.—*Presence of Hemoquinic Acid in.*—Nierenstein finds in the urine of patients taking quinine a new decomposition product of that alkaloid, hemoquinic acid. This occurs in crystals melting with decomposition at 183° and forms a picrate melting at 224°. It gives a blue color with Herapath's reagent; has hemolytic properties and is presumably methoxy quinoline-glyoxylic acid.—*J. Roy. Army Med. Corps*; through *J. pharm. chim.*, 20 (1919), 285.

Urine.—*Detecting Indican in.*—Jaffe's method for detecting indican depends on the oxidation of indican to indigo by means of chlorinated lime. Obermeyer improved the method by applying ferric chloride as oxidizing agent. J. A. Jolles found that by oxidizing indoxyl with ferric chloride in the presence of thymol still better results are obtained. This shows that an indoxyl derivative of a coerulignon-like structure, 4-cymol-2-indolindolignon is formed. The test is carried out by adding to 10 mls of urine, 2 mls of a 20 per cent. lead acetate solution, filtering and shaking the filtrate with one ml of a 5 per cent. alcoholic solution of thymol and 10 mls of a 0.5 per cent. ferric chloride solution in fuming hydrochloric acid. After allowing to stand for 15 minutes, the mixture is shaken with 4 mls of chloroform, to which, in the presence of indican, a blue color is imparted, the intensity of which varies with the amount of indican present. The method by which 0.0032 mgm. of indican in 10 mls of urine can be detected, has the advantage over the other two in that a pure blue color is produced, while in the others indigo red and indigo brown are liable to be formed. The method can also be used for estimating indican colorimetrically using as a standard a solution of 10 mgm. of synthetically prepared 4-cymol-2-indolindolignon in 100 mls of chloroform. Alphanaphthol can be used in place of thymol but this method cannot be used for a colorimetric estimation because no uniform blue color but a mixture of several colors is produced. The reaction can also be used for detecting indican in blood and in the cerebrospinal fluid. In connection with E. Schwenk the author has prepared the potassium salt of indigo sulphonic acid, the chief constituent of urine-indican, by condensing chlor-sulphonic acid with acetindoxyl.—*Mediz Klinik*, through *Pharm. Weekblad*, 56 (1919), 1549. (H. E.)

Urine.—*Condition in Influenza.*—Patein and Colombert find that the urine of persons suffering with influenza always contains indoxyl and urobilin, and that frequently albumin is present, however, not in excessive quantities. Most characteristic of these urines is an astonishingly high increase in urea and decrease in chlorides. On account of the small amount of salts present in the urine the estimation of the albumin presents some difficulty, and it is, therefore, recommended to add to each 100 mls of urine 20 grammes of sodium sulphate before boiling.—J. pharm. chim.; through Drug. Circ., 63 (1919), 145.

Urine.—*Assay of Ketones in.*—Fabre and Clogne acidulate a urine with sulphuric acid and distil it, thus obtaining in the distillate the free acetone and that obtained by the decomposition of acetoacetic acid. The residue is then treated with potassium dichromate and the distillate then contains acetone produced by the decomposition of beta oxybutyric acid. The authors distinguish between the two sources of acetone by calling that forming the acetone in the first distillate ketonic bodies and those bodies yielding acetone only after oxidation, ketogenic bodies.

The article contains a table showing grammes of acetone per liter of urine obtained from normal persons and from those suffering from fatigue, from severe wounds, from shock and from gaseous gangrene. In the two latter groups, the acetone content was the highest.—Compt. rend. soc. biol.; through J. pharm. chim., 19 (1919), 113.

Urine.—*Detecting Methylene Blue in.*—Tribondeau acidifies the urine to be tested with acetic acid, fragments of thymol are added, and the mixture is boiled. The thymol collects on the surface, carrying with it the pigment.—Compt. rend. soc. ciol.; through Chem. and Drug., 91 (1919), 39.

Urine.—*Nitrogen Assay of.*—E. Pittarelli discusses the various methods of determining nitrogen and then recommends the following procedure. Take 1 mil of a 10 per cent. dilution of the urine, add 1 mil of concentrated sulphuric acid and 1 drop of phenol, the latter being employed to help the transformation of nitric and nitrous compounds into ammonia. Boil the mixture for a few minutes, finally adding a small amount of potassium persulphate to secure complete decoloration. The mixture is then cooled, is

diluted with 20 to 25 mls of water and washed with another 25 mls of water into a 250 mil cylinder. Then add a few drops of phenolphthalein solution, enough sodium carbonate solution to turn faint rose color, then add 10 mls of the following reagent: Saturated solution of sodium bicarbonate, 3 volumes; Saturated solution of mercuric chloride, 1 volume; and lastly, enough water to make 250 mls. The opalescence thus produced is matched by adding to a mixture of 10 mls of the reagent and water to make 250 mls, contained in a cylinder, centinormal ammonia from a burette until the same degree of opalescence is obtained as is shown in the urine samples.—*Riv. crit. clin. med.*; through *J. pharm. chim.*, 20 (1919), 32.

Urine.—*Detection of Quinine in.*—Ramsden and Lipkin find that the thalleioquin reaction is sensitive 1 in 40,000 and that Mayer's reagent will detect one part of quinine in 500,000.

In quantitative work, the blood is clarified with ammonium sulphate and the urine with lead acetate and ammonium sulphate in acetic medium. In either case, the filtrate is made alkaline with ammonia water, the alkaloid is shaken out with ether free from ketones and the ethereal extract is dissolved in saturated ammonium sulphate solution. To this solution, Mayer's reagent is added and the turbidity is compared with similar turbidity produced in standard quinine solutions. By this means 0.02 to 0.03 milligrammes of quinine in 5 mls of blood can be determined with no more than 5 per cent. error.—*Ann. Trop. Med.*; through *J. pharm. chim.*, 19 (1919), 47.

Urine.—*Counting of Renal Casts in.*—F. E. Niece describes his system of counting renal tubule casts including the enumeration of the various steps in the analysis of a 24-hour specimen of urine.

The various kinds of casts; their composition, color and shape; are some of the items noted by the author as an aid in the differentiation and classification of urinary sediments.—*Pract. Drug.*, Jan., 1919, 23. (F. H.)

Urine.—*Simplified Kjeldahl Assay of.* Folin and Wright present the following method, which they say can be performed in from 20 to 25 minutes: Transfer 5 mls of urine to a 300 mil Kjeldahl flask, add 5 mls of a phosphoric-sulphuric mixture (50 mls of a 6 per cent. copper sulphate solution, 300 mls of 85 per

cent. phosphoric acid and 100 mls of concentrated sulphuric acid), 2 mls of 10 per cent. ferric chloride solution and 4 to 6 small pebbles to prevent bumping. Boil vigorously during 3 to 4 minutes and then, when white fumes begin to arise, cover mouth of flask with a watch-glass, then boil another 2 minutes, when the carbonaceous matter will be completely destroyed. Then boil gently for another 2 minutes, cool during five minutes, then add 50 mls of water, 15 mls of a 50 per cent. solution of sodium hydroxide, connect the flask by means of cork stopper and ordinary tubing with a receiver containing 75 mls of tenth-normal acid, distil during five minutes, and then titrate the fluid in the receiver, using alizarin red as indicator. If milk were employed, the period of digestion should be increased.—J. Biol. Chem.; through Chem. Abstracts, 13 (1919), 2381.

Urine.—*Technic for Staining Sediments from.*—Minerbi heats the isolated urine sediment with human blood serum or egg albumin, both of which coagulate under the action of fixation measures. Then when the May-Grunwald-Giemsa stain is applied, the background is homogeneous and colorless, and the preparation is exceptionally instructive in every respect. After centrifugating the urine, all the fluid is decanted except one or two drops. Then a droplet of egg albumin is taken up on a platinum loop and the loop is plunged into the sediment and agitated to mix it, with care not to cause production of bubbles. Then the mouth of the tube is held slanting on an object glass and with the platinum loop a droplet is spread all over the object glass, and two other slides are prepared in the same way. Before drawing out the sediment, the loop is singed to be sure that no undissolved albumin is sticking to it.—Rivista. Crit. Clin. Med.; through Pract. Drug., April, 1919, 34.

Urea.—*Gasometric Assay of.*—Frerichs and Mannheim suggest the use of a burette in lieu of the usual ureameter in the hypobromite assay of urea.—Arch. Pharm.; through Chem. Abstracts, 13 (1919), 1515.

Urea.—*Study of Assay Methods.*—M. Philibert presents a careful study of the Fosse xanthidrol, the Folin and the hypobromite assay of urine. He shows the sources of error in the hypobromite method and suggests the following modifications whereby these errors may be avoided.

One error comes from the type of ureameter generally used. This he obviates by a specially devised ureameter which is pictured in the article. The other errors are lessened by using exact quantities of hypobromide solution and alkaline solution.

For details the reader is referred to the original paper.—J. pharm. chim., 19 (1919), 335, 386 and 434.

Urea.—*The Hypobromite Assay of.*—L. Lescœur presents a long and careful study of this important reaction. He finds that the reaction is rarely molecular since the yield of nitrogen is usually 5 to 10 per cent. below the theoretical quantity: that this deficit is not constant, being dependent upon the relative amounts of urea and alkali employed, as can be shown by means of a graph. He then discusses the various theories suggested to explain the deficit and comes himself to the conclusion that some of the urea is converted into ammonium cyanate which does not evolve all of its nitrogen when treated with alkaline hypobromite.—J. pharm. chim., 20 (1919), 305, 343 and 374.

Urea.—*Formation from Blood Proteids and from Glucose.*—Previous work showing that glucose is capable in the presence of proteids or of ammonia of forming urea, Fosse applied the principle practically by oxidizing a mixture of blood proteids and glucose with potassium permanganate. By this method he was able to obtain 40 grammes of urea from 1 liter of blood.—Compt. rend.; through J. pharm. chim., 20 (1919), 102.

Urea.—*Origin in Plants.*—R. Fosse states that from the two simple compounds, formaldehyde and hydrocyanic acid, either alone or together, not only urea but also carbohydrates, acid amides, xanthine and purine bases are prepared by plants; the syntheses beginning $\text{HCHO} \rightarrow \text{HCN} \rightarrow \text{HCNO} \rightarrow \text{CO}(\text{NH}_2)_2$.—Compt. rend.; through J. pharm. chim., 20 (1919), 129 and 161.

Uric Acid.—*Assay in Urine.*—F. Telle adds to 100 mls of neutral or acid urine 10 mls of a diluted solution of sodium borate, filters and adds to 55 mls of the filtrate 10 grammes of ammonium chloride and 10 mls of ammonia water. After allowing the mixture to stand over night the precipitate is collected on a filter washed with a liquid containing 12.5 per cent. of ammonium chloride, and 10 per cent. of ammonia water, is then dissolved in 150 mls of

water and 10 mils of diluted sulphuric acid and the uric acid is titrated with standardized potassium permanganate solutions. Alkaline urines and urines containing ammonia should first be acidulated with hydrochloric acid before being mixed with borax solution.—Bull. sci. pharmacol.; through Pharm. Weekblad, 56 (1919), 984. (H. E.)

Uric Acid.—*Assay in Blood.*—For estimating uric acid in blood, L. Morris recommends precipitating the acid from 25 mils of blood as zinc urate, dissolving the zinc salt in hydrochloric acid and precipitating the zinc from this solution by sodium phosphate. After the addition of 25 mils of a diluted sodium bicarbonate solution, 5 mils of a 10 per cent. potassium iodide solution and a few drops of starch solution, the mixture is titrated with 0.002 normal potassium permanganate solution until a blue color is developed. Only when all the uric acid has been oxidized, an oxidation of the potassium iodide with the liberation of iodine, takes place.—Proc. Soc. Biol. Chem.; through Pharm. Weekblad, 56 (1919), 684. (H. E.)

Blood.—*Assay of Iron in.*—L. Berman treats the blood with concentrated hydrobromic acid (to free the iron) and then with potassium permanganate to destroy the organic material. The resulting ferric solution is then assayed colorimetrically with sulphocyanate.

The assay can be performed in 15 minutes and the amount of blood need not be greater than 0.04 mils.—J. Biol. Chem.; through J. pharm. chim., 19 (1919), 48.

Blood.—*Assay of Urea and Non-Protein Nitrogen in.*—After discussing the pathological significance of the ratio of urea in the blood and urine and after describing minutely the various proposed methods of urea assay (notably the work of Folin and the urease process), Grigaut and Guérin recommended the following methods which they claim have the great advantage of requiring only a small amount of blood.

Urea Assay of Blood.—Mix 1 volume of blood with 2 volumes of a 1 per cent. aqueous suspension of soy bean, let stand 2 hours at room temperature and then 15 minutes at 56°. This hydrolyzes the urea into ammonia and the process is facilitated by the addition of monosodium phosphate (0.4 gramme in 100 mils of soy bean suspension). Then add to the mixture its own volume of 20 per cent.

trichloroacetic acid, shake vigorously and then filter. Place a known volume of the filtrate (1 to 6 mls) in a graduated 50-mil bottle; water to make 40 mls; 10 per cent. sodium hydroxide solution free from carbonates and sulphates, 3 mls; and then 5 mls of Nessler's reagent and water to make 50 mls. Prepare under similar conditions, a Nesslerized solution of ammonium sulphate of known strength and then compare the two fluids in a Duboscq colorimeter.

Non-Protein Nitrogen Assay of Blood.—Mix the sample with twice its volume of 20 per cent. trichloroacetic acid, filter, add to 2 mls of the filtrate, 1 mil of a phospho-sulphuric mixture (100 mls of 66° sulphuric acid, 300 mls of 60° phosphoric acid and 25 mls of 10 per cent. copper sulphate solution), and pumice stone and boil at least 2 minutes as in the Kjeldahl digestion. Transfer the digested clear bluish liquid to a 100-mil graduated flask, rinse the digesting test-tube and the pumice with water, make alkaline with 10 per cent. sodium hydroxide solution, add 10 mls of Nessler's reagent and enough water to make 100 mls. Mix in the same manner ammonium sulphate solution with the phospho-sulphuric mixture, the soda solution and Nessler's reagent and compare the two fluids in a Duboscq colorimeter.

The same process may be used for assaying urea and non-protein nitrogen in tissue, by digesting the tissue in successive portions of water containing chloroform as a preservative, concentrating the aqueous extract and then handling it as directed above for either urea or non-protein nitrogen.

The article gives a number of tables showing results of assays by the author's procedure as well as by other standard methods.—*J. pharm. chim.*, 19 (1919), 233 and 281.

Blood.—*Test for Occult.*—W. T. Vaughan mixes a small portion of the solid feces placed on a glass slide with a few grains of powdered benzidine, a few drops of glacial acetic acid and a few drops of solution of hydrogen dioxide. If a bluish green color results, blood is present.—*J. Lab. Clin. Med.*; through *Am. J. Pharm.*, 91 (1919), 119.

Snapper argues the importance of spectroscopy for determining the presence of occult blood in the stools. He declares that this is so important that no one should hesitate to acquire a spectroscope and perfect himself in its use. The color reactions are not dependable, he says, peroxidases in the absence of blood being liable to

give positive reactions, while the blood may be absorbed in the intestinal canal and none reach the anus or be eliminated in a porphyrin combination. With the spectroscope we have two means of determining the presence of blood, the spectrum for hemochromogen and the spectrum for porphyrin. When the blood is eliminated in the form of a combination of porphyrin it does not respond to any of the color tests for occult blood.—Ned. Tid. Geneesk.; through *Drug. Circ.*, 63 (1919), 284.

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c. Horlick's Malted Milk Co.,
Racine, Wis.
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 Ill.
 Varga, Louis Nicholas,
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 Vargas, Heredis Jorge,
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 Va.
 Varlet, Miss S.,
 R. F. D. No. 6, Box 51, Richmond,
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 Varnum, Walter H.,
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 Kansas.
 Vaupell, Geo. F., Ph.C.,
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 Vellema, Peter,
 5 Leonard St., N. W., Grand Rapids,
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 Velsor, Joseph H.,
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 Vena, John J.,
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 Hotel, Atlantic City, N. J.
 Verneau, Edward J.,
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 Vernor, James,
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 Vestal, John Wilfred,
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 Veve, Miguel A.,
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 Victor, Paul,
 LaCrosse, Wash.
 Vidaurreta, Saturnino,
 Santa Barbara, Honduras, C. A.
 Viehoever, Arno, M.D.,
 Pharmacologist in Charge, Phar-
 macognosy Laboratory, Bureau
 of Chemistry, Dept. of Agriculture,
 Washington, D. C.
 Vikre, Sigfred M.,
 Boyd, Minn.
 Vierung, Edward Alois,
 114 Main St., Terryville, Conn.
 Vilas, Fred L.,
 Pierre, S. D.
 Villamena, Diadato,
 2237 1st Ave., New York, N. Y.
 Villamena, Ermilinda M.,
 204 E. 116th St., New York, N. Y.
 Vincent, Sister Mary,
 St. Mary's Hospital, Duluth, Minn.
 Vodheim, Joseph,
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 Vogel, Mary Lynch (Mrs.),
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- Vondrasek, Albert Frank,
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- Von Hermann, Eugene,
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- Vorsanger, Lillian,
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- Voss, Edw., Jr.,
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- Votteler, Wm.,
Shelby & Oak Sts., Louisville, Ky.
- Vowell, Louis S.,
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- Wagaman, Emmett E.,
49 No. Main St., Chambersburg,
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- Wagener, Leonard R.,
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Mich.
- Wagoner, Athol L.,
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- Wagner, Arthur C.,
11 Pierce Ave., Everett, Mass.
- Wagner, Clarence K.,
350 S. Third St., Lehigh, Pa.
- Wagner, Garrett Edward,
4th and Water Sts., Belle Vernon,
Pa.
- Wagner, Louis,
Mountain View, Cal.
- Waidelich, Harold Russell,
1145 Linden St., Allentown, Pa.
- Waits, Chas. Forrest,
c. Edwards House, Jackson, Miss.
- Wakefield, T. S.,
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- Wakeman, Nellie A.,
356 Chemistry Bldg., Madison, Wis.
- WALBRACH, ARTHUR,
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- Waldschmidt, Oliver A.,
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Wis.
- Walker, Alfred,
Sutton, W. Va.
- Walker, Charles F.,
1801 Hull St., Richmond, Va.
- Walker, Charles Robert,
Ensley, Ala.
- Walker, Robert H., B.S., Ph.M.,
Gonzales, Tex.
- Walker, Robert Lee,
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- WALL, OTTO A.,
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- Wallace, Arthur G.,
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- Wallace, Mrs. Emma K.,
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- Wallace, George R.,
426 Fairmount Ave., Philadelphia,
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- Wallace, John A.,
407 Grove St., Avoca, Pa.
- Wallace, John C., Ph.D.,
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- Wallace, Lew,
805 6th Ave., Laurel, Miss.
- Walleck, Andrew E.,
8341 Woodland Ave., Cleveland,
Ohio.
- Wallen, Alvin U.,
606 Front St., Brainerd, Minn.
- Walsdorf, Edw. H.,
900 Peters Ave., New Orleans, La.
- Walsh, Edward Porchet,
Florence, S. C.
- Walter, Herman,
213 Second Ave., New York, N. Y.
- Walter, Peter G., Ph.G., Ph.D.,
Chestnut and Lockhart Sts., Pittsburgh, Pa.
- Waltermann, Henry B.,
5th and Lock Sts., Cincinnati, O.
- Walton, Lucius L., Ph.G., Ph.M.,
Ph.D.,
N. E. Cor. 4th and Pine Sts., Williamsport, Pa.

- Walz, Jacob L.,
2128 Mt. Holly St., Wallbrook,
Baltimore, Md.
- Ward, M. E.,
Jackson, Miss.
- Wardle, Arthur S.,
1-3 Warren St., Hudson, N. Y.
- Wardwell, Wilson B.,
Ellendale, Minn.
- Ware, F. M.,
State & Pearl Sts., Jerseyville, Ill.
- Waring, Olaf I.,
154 11th St., Long Island City, N. Y.
- Warn, Wm. E.,
50 First St., Keyport, N. J.
- Warne, Cyrus B.,
Redfield, S. D.
- Warner, Carl A.,
5201 Broadway, Chicago, Ill.
- Warner, Cortice M.,
4357 N. Penn St., Indianapolis, Ind.
- Warren, Lewis E.,
535 N. Dearborn St., Chicago, Ill.
- Washburn, Crosby B.,
206 Kitchener Ave., Detroit, Mich.
- Wasserscheid, A. A.,
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- Watkins, Esla Kennedy,
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- Watson, George N.,
1009 Maine St., Lawrence, Kan.
- WATSON, HERBERT K.,
803 Market St., Wilmington, Del.
- Watson, Joseph R., Ph.C.,
330 18th Ave., N., Seattle, Wash.
- Watson, Robert Gordon,
1103 Cook St., Denver, Colo.
- Watson, Wm., Jr.,
1117 Howard Ave., Utica, N. Y.
- Watters, Henry,
138 Rideau St., Ottawa, Can.
- Watts, Thomas McCoy,
Holstein, Iowa.
- WAUGH, GEO. J.,
Ontario St., Stratford, Ontario, Can.
- Waugh, Herbert F.,
Mt. Pleasant, Iowa.
- Waxman, Lewis W.,
6528 Ashland Ave., Chicago, Ill.
- Way, James E.,
102 West Main St., Jackson, Mich.
- Wear, John,
517 Holly St., Philadelphia, Pa.
- Weaver, Clarence A.,
941 Trumbull Ave., Detroit, Mich.
- Webb, Edw. N.,
2120 Iuka Ave., Columbus, O.
- Webb, Raymond S.,
4215 Westminster Pl., St. Louis, Mo.
- Webber, M. Elbert,
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First Gas Regiment, Honolulu,
H. J.
- Webber, Thelma,
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- Weber, Don C.,
Arlington, Neb.
- Webster, Cyrus Christopher,
100 E. Main St., Staunton, Ill.
- Webster, John H., Ph.G.,
2900 Jefferson St., Detroit, Mich.
- Webster, Richard C.,
26 N. Main St., Canton, Ill.
- Weeks, Carl,
Des Moines, Ia.
- Wegner, Otto William,
1705 Infantry Ave., Detroit, Mich.
- Weicker, Herman G.,
136 Liberty St., New York, N. Y.
- Weicker, Theo.,
Prospect Manor, Stamford, Conn.
- WEIDEMANN, CHAS. A., Ph.G., M.D.,
2148 Green St., Philadelphia, Pa.
- Weidman, I. S.,
2938 N. Bailey St., Philadelphia, Pa.
- Weidner, Elmer M.,
Birdsboro, Pa.
- Weimer, Roth Eardon,
20 Wabash St., W. E., Pittsburgh,
Pa.
- Weinberg, Samuel Ernest,
691 23rd Ave., San Francisco, Cal.
- Weinberger, Adolph,
3001 Scoville Ave., Cleveland, O.
- Weinkauff, Jacob,
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- Weinstein, Samuel,
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- Weireter, John,
 3401 Southport Ave., Chicago, Ill.
 Weise, Carl E.,
 2704 West End Ave., Nashville, Tenn.
 Weismiller, Paul V.,
 1114 N. St. Clair St., East Liberty
 P. O., Pittsburgh, Pa.
 Weisner, Nicholas F.,
 20th and Parrish Sts., Philadelphia,
 Pa.
 Weiss, Emil O.,
 794 6th Ave., New York, N. Y.
 Weiss, Josephine Mary,
 121 W. Jefferson St., Iowa City,
 Iowa.
 Weiss, Louis Ralston,
 4807 N. Hermitage Ave., Chicago, Ill.
 Weiss, Sydney,
 1819 W. 39th St., Chicago, Ill.
 Weitgenant, Wayne W.,
 100 N. 1st St., Raton, New Mexico.
 Welfare, Sam E.,
 Winston-Salem, N. C.
 WELLCOME, HENRY S.,
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 Welsh, Joseph B.,
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 83 Vaughn St., Dorrancetown, Pa.
 Wendt, Wm. C.,
 47 S. High St., Columbus, O.
 Wentland, William Henry,
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 Werkheiser, Harold Edwin,
 713 Bushkill St., Easton, Pa.
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 Westcott, James W., Ph.G.,
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 Md.
 Westenfelder, Chas. W.,
 37 E. Main St., Springfield, O.
 Westheimer, David,
 305 Commercial Bank Bldg.,
 Houston, Tex.
 Westmoreland, Edwin R., Ph.G.,
 Lockhart, Tex.
 Wetterstroem, Caroline (Mrs.),
 2844 Colerain Ave., Cincinnati, O.
 Wetterstroem, Theo. D., Ph.G.,
 514 Schultzt Bldg., 232½ N. High,
 Columbus, Ohio.
 Weygandt, William H.,
 170 S. 9th St., Brooklyn, N. Y.
 Wheatcroft, John C.,
 c. American Buying Club, 31 W.
 Lake St., Chicago, Ill.
 Wheeler, Albert A., Phar.D.,
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 Wheeler, Carlton B.,
 18 Main St., Hudson, Mass.
 WHELPLEY, HENRY M., Ph.G., M.D.,
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 Whidden, Ray Allen,
 161 N. Franklin St., Chicago, Ill.
 Whipple, Oscar Kellogg,
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 N. J.
 Whisenhaut, Nathaniel Lyon,
 742 Poydras St., New Orleans, La.
 White, Benjamin,
 375 South St., Jamaica Plain, Boston,
 Mass.
 White, Edw. R.,
 Main St., Salisbury, Md.
 White, Elliott Sylvester,
 Residence Unknown.
 White, Herbert E.,
 Jamestown, N. D.
 White, Jennie Maguire,
 416 Hayes St., San Francisco,
 Cal.
 White, Joseph L.,
 453 19th St., Brooklyn, N. Y.

- White, Louis Mortimore,
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Okla.
- White, Robert C.,
23 N. 7th St., Philadelphia, Pa.
- White, Roy Allen,
3605 W. 32nd Ave., Apt. 8, Den-
ver, Colo.
- White, W. D.,
12 Laning Bldg., Wilkes-Barre, Pa.
- White, Walter H.,
39 S. Palifox St., Pensacola, Fla.
- White, Wm. R., Ph.C.,
311 Grace St., Nashville, Tenn.
- Whitehill, John,
3328 Chestnut St., Philadelphia,
Pa.
- Whitehouse, Harry,
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- Whitley, J. F.,
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- Whitlock, William Thomas,
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- Whitney, David V., Ph.G.,
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- Whitney, Maxson Hall,
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- Whitney Minnie, M. (Mrs.),
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- Whitney, Robert Buckingham,
Residence Unknown.
- Whittemore, Lee A.,
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- Whittington, Omar Harwell,
Van Buren, Ark.
- Whittlesey, Henry H.,
East Side Pharmacist, Pocatello,
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- Whorton, Carl,
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Co., Gadsden, Ala.
- Whyte, Hilson H.,
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- Wich, Henry E.,
1230 N. Stricker St., Baltimore, Md.
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- Widrig, T. J.,
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- Wieczorek, Walter W.,
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- Wierks, Clarence,
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port, Iowa.
- Wiertelak, Albert P.,
4643 S. Mozart St., Chicago, Ill.
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- Wilcox, Guy Wilber,
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- Wilcox, Levi, Ph.B.,
145 Woodlawn Ter., Waterbury,
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- Wilder, Gaston H.,
510 23rd St., Galveston, Texas.
- Wiles, Wood,
104 W. Walnut St., Bloomington,
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- Wilkerson, A. F.,
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- Wilkes, Miss Jean Robin,
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- Williams, Daniel T.,
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- Williams, Edward,
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- Williams, George,
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- Williams, Guy Yandall,
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- Williams, John E.,
32 Adams Ave., W., Detroit, Mich.
- Williams, John Lewis,
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- Williams, John M.,
c. Marinello Co., La Crosse, Wis.
- Williams, Lawrence S.,
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- Williams, N. Emery, Ph.G.,
508 N. Grand Ave., St. Louis, Mo.
- Williams, Thomas R.,
Larimore, N. D.
- Williams, Walter G.,
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- Williamson, Gordon James,
3 Charles St., Dorchester, Mass.
- Williamson, Harry Hays,
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Cal.
- Williamson, J. W.,
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- Williamson, Thomas M.,
40 N. Market St., Frederick, Md.
- Willman, Wm. G.,
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- WILSON, BENJ. O.,
19 Morse St., Newton, Mass.
- Wilson, Chas. E.,
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- Wilson, Chas. F.,
c. Pitman & Wilson, Rushville, Ind.
- Wilson, Edward Claudius,
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Pharm., Norfolk, Va.
- Wilson, Eugene C.,
516 Park Ave., Burlington, N. C.
- Wilson, Lincoln,
3973 Tennyson St., Denver, Colo.
- Wilson, Nathan Warren,
706 Delaware St., Kansas City, Mo.
- Wilson, Phil R.,
10 Broadway, Fargo, N. D.
- Wilson, Robert C.,
University of Georgia, Athens, Ga.
- Wilson, Smith C.,
143-145 N. 9th St., Lincoln, Neb.
- Wilson, Wm. N.,
Independence, La.
- Wiltsee, Lee,
c. Merrell Co., 5th and Pike Sts.,
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- Wimmer, Curt Paul,
115 W. 68th St., New York, N. Y.
- Wincott, Robert T.,
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Md.
- Winne, Arthur L. I.,
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261 Columbus Ave., New York, N. Y.
- Witt, Charles T. A.,
Residence Unknown.
- Witt, William John,
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1711 Penna St., Denver, Colo.
- Wittkamp, Clarence T.,
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- Wittman, Albert W.,
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- Woehner, Fred A.,
c. Great Falls Drug Co., Great Falls,
Mont.
- Woehner, Walter Albert,
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Bldg., Baltimore, Md.
- Wolf, Chas. A.,
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- Wolf, J. Carlton, Phar.D.,
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313 Union St., Lynn, Mass.
- Wolff, Edw. H.,
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- Wolff, Fred,
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- Wood, Horatio C., Jr., M.D.,
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- Wood, I. V.,
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- Wood, James P.,
2 Church St., New Haven, Conn.
- Woods, Robert J.,
Winnett, Mont.
- Woods, Samuel R.,
110 S. Main St., Lamar, Colo.
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- Wulling, Charles Wm.,
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- Yaffe, Joseph Philip,
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- Yarbrough, Charles George,
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155 Leonard St., New York, N. Y.
- Yeager, Emery James,
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- Yeomans Sidney C.,
c. American Druggists' Syndicate,
Long Island, N. Y.
- Youngue, James Douglas,
Pickens, S. C.
- Young, Andrew Palmerston,
143 Grand River Ave., Detroit,
Mich.
- Young, Fred H.,
Lake Bluff, Ill.
- Young, Geo. O.,
Buckhannon, W. Va.
- Youngken, Heber W., Ph.G., A.B.,
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- Zagat, Mendel,
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Minn.
- Zander, Arthur W.,
2253 Burling St., Chicago, Ill.
- Zeamer, Harry W.,
240 Locust St., Columbia, Pa.
- Zehner, Guy Oram,
c. Bristol Myers Co., Hillside
Plant, W. Elizabeth, N. J.
- Zeigler, Washington Hayne,
c. Medical College of S. C., 213
Rutledge Ave., Charleston, S. C.
- Zeluff, Irvin Simpson,
Farmers Ave., Hollis, Long Island,
N. Y.
- Zeman, Isador Louis,
110 Fullerton St., Pittsburg, Pa.
- Zettelmeyer, Herbert,
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- Zickes, Elmer Joseph,
4521 Clark Ave., S. W., Cleveland,
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- Ziefe, Adolph,
Oregon Agriculture College, Cor-
vallis, Ore.
- Ziegler, Howard P.,
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Ohio.
- Zieske, Arthur, Ph.G.,
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S. D.
- Zillig, Adam,
Dubuque, Iowa.
- Zimmerman, Theophilus,
Rose Free Dispensary, 7th and
Cherry Sts., Terre Haute, Ind.
- Zingales, Gaetano,
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- Zink, Edward,
203 Fulton St., New York, N. Y.
- ZOELLER, EDW. V.,
Main St., Tarboro, N. C.
- Zoeller, Geo.,
1557 W. Chicago Ave., Chicago, Ill.
- Zonies, Nathan,
29th and Diamond Sts., Phila-
delphia, Pa.
- Zook, Carl E.,
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- Zuck, F. J.,
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Kenmare, N. D.

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Ill.

Zwilling, Harry,
108 Pitt St., New York, N. Y.

GEOGRAPHICAL ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

AUSTRALIA.

J. H. Maiden, *Sydney*, 1920.

ENGLAND.

Sir William Glyn Jones, *London*, 1920.

E. M. Holmes, F.L.S., *London*, 1899.

Henry George Greenish, *London*, 1913.

David Hooper, F.I.C., F.C.S., *Weston*, 1899.

Wm. Kirkby, M.Sc., *Manchester*, 1920.

FRANCE.

Prof. Emilie Bourquelot, *Paris*, 1920.

Prof. Leon Guignard, *Paris*, 1920.

GERMANY.

Dr. Arthur Meyer, *Marburg*, 1910.

Dr. Herman Schelenz, *Cassel*, 1912.

SWITZERLAND.

Dr. Heinrich Zoernig, *Basel*, 1916.

Dr. Alexander Tschirch, *Berne*, 1910.

ACTIVE MEMBERS.

(List corrected to October, 1921.)

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in Capitals. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA.

ALABAMA.		<i>Guntersville.</i>	
		Thomason, William Pearce.....	1910
	<i>Auburn.</i>	<i>Haleyville.</i>	
Blake, Lynn Stanford.....	1914	Foster, H. B.....	1921
Frazier, Hardaway.....	1920	<i>Huntsville.</i>	
Marsh, George Henry.....	1920	Latham, Carter H.....	1921
Toomer, S. L.....	1918	<i>Lineville.</i>	
	<i>Birmingham.</i>	Hubbard, Newman Grady.....	1918
Adams, William Jackson.....	1918	<i>Madison.</i>	
Chumley, Tim V.....	1921	Wilkinson, T. D., Jr.....	1921
Gibbs, Elbert W.....	1921	<i>Marion.</i>	
Kissell, Vertle T.....	1921	Wilkerson, A. F.....	1922
Krauss, V. E.....	1921	<i>Mobile.</i>	
Letaw, David.....	1921	Bauer, Segmond H.....	1920
Morris, L. G.....	1921	Ching, Mrs. Florence Palmer....	1921
Patton, John W.....	1921	Demuny, Marshall J.....	1915
Pittman, Winston J.....	1921	Ebbecke, Philip Gustave.....	1922
Shiflett, Barry O'Neal.....	1920	Eichold, Bernard Herbert.....	1905
	<i>Camp Sheridan.</i>	Mitchell, Dan.....	1921
Lundgren, Sgt. Rudolf.....	1913	Moog, Miss Alice.....	1921
	<i>Chickasaw.</i>	Wood, I. V.....	1921
Pugh, Earl Elmo.....	1921	Van Aller, Thomas S.....	1907
	<i>Ensley.</i>	Van Antwerp, James Callanan....	1905
Fleming, R. W.....	1921	<i>Monroeville.</i>	
Walker, Charles Robert.....	1918	Yarbrough, Charles George.....	1921
	<i>Fairfield.</i>	<i>Plateau.</i>	
Herlong, E. A.....	1921	Butterley, William Starr.....	1921
	<i>Foley.</i>	<i>Prattville.</i>	
Dumas, James T.....	1921	Scott, Clarence Alexander.....	1905
	<i>Gadsden.</i>	<i>Selma.</i>	
McDiarmid, Daniel Palmer.....	1909	Mullins, Randolph P.....	1921
Vance, Winfield Scott.....	1909		
Whorton, Carl.....	1908		

ALABAMA—ALASKA—ARIZONA—ARKANSAS—CALIFORNIA.

<i>Tuscaloosa.</i>		<i>Leslie.</i>	
Bingham, William Ellison, A.B., Univ. of Miss.	1909	Fendley, Albert Harrison	1920
<i>Tuskegee.</i>		<i>Little Rock.</i>	
Lewis, Lawrence Campbell.	1910	Bracy, Samuel Virginus.	1922
<i>York.</i>		Bradford, John Davis.	1920
Scruggs, Robert Houston.	1921	Hanggi, Emil John.	1920
ALASKA.		McClerkin, Felix Wm.	1918
<i>Anchorage.</i>		Nixon, Will Elmer.	1920
Loussac, Zachary Joshua.	1916	Schachleiter, Frank.	1917
ARIZONA.		Snodgrass, Latta Kavanaugh ...	1901
<i>Mesa.</i>		Trevaskis, Wm. J.	1918
Grandy, Seth Parker.	1916	<i>Montrose.</i>	
<i>Nogalez.</i>		Malow, James B.	1920
Nankivell, John H.	1919	<i>Paragould.</i>	
ARKANSAS.		Kirber, Richard Henry.	1920
<i>Atkins.</i>		<i>Piggott.</i>	
Hogan, Walter C.	1918	POTTER, MAYNARD H., Ph.G., Ph.C.	1906
<i>Blytheville.</i>		<i>Pine Bluff.</i>	
Barnett, William T.	1920	Lewis, Robert Henry, Jr.	1918
MORGAN, AYLMER LEE.		<i>Van Buren.</i>	
<i>Camden.</i>		Whittington, Omar Harwell.	1915
McComb, Joel Virgil.	1921	<i>Warren.</i>	
<i>Crawfordsville.</i>		Appleton, William Riley.	1901
Kendall, William Edward.	1920	Davis, A. T.	1914
<i>Fort Smith.</i>		<i>West Memphis.</i>	
Godt, Florenz Charles.	1920	Dodd, Adam Samuel.	1921
Latimer, Booker.	1920	<i>Wilmar.</i>	
<i>Glenwood, Pike Co.</i>		Hilliard, Isaac F.	1920
Sparks, James Mitchell.	1894	<i>Winthrop.</i>	
<i>Dewitt.</i>		Peavy, Jesse Leroy.	1920
Townsend, Rupert Richard.	1919	CALIFORNIA.	
<i>Havana.</i>		<i>Altadena.</i>	
Valentine, Cuthbert O.	1920	Leavitt, Adoniram Judson. .	1905
<i>Hot Springs.</i>		<i>Arrow Head Springs.</i>	
Caldwell, Charles B.	1921	Southard, Frank A., Ph.G	1903
Eisele, Martin Augustine.	1907	<i>Auburn.</i>	
Grant, Frank Joseph.	1920	Stevens, Frederick Solon	1903
Lehman, Charles Walter, A.B	1907	<i>Bakersfield.</i>	
		Baer, Edward Arthur	1907
		Hughes, James A	1909

CALIFORNIA.

<i>Berkeley.</i>		<i>Sacramento.</i>	
Lea, E. J.	1918	Grazer, Frederick Augustus.	1922
Mueller, Fred.	1915	Kirk, H. S.	1913
<i>Escondido.</i>		Lichthardt, Geo. H. P.	1902
STEVENS, ALVISO BURDETTE.	1885	<i>San Diego.</i>	
<i>Eureka.</i>		Strahlmann, Edward.	1909
Bohmansson, Robert Hugo.	1901	Williamson, Harry Hays, B.S.	1916
<i>Fresno.</i>		<i>San Francisco.</i>	
Lich, Robert.	1917	Carey, Henry B.	1909
<i>Gilroy.</i>		Coats, Miss Zoe.	1912
Rasmussen, Ethel.	1920	Cole, John N.	1918
<i>Half Moon Bay.</i>		Dunbar, E. A.	1916
Morgan, Charles Levin.	1915	Eaton, Elgar Otis.	1915
<i>Huntingdon Park.</i>		Fletcher, David M.	1904
Guest, Wilbert Hillman.	1909	Flint, John Henry.	1909
<i>Long Beach.</i>		Gibson, Frank L.	1904
Smith, Lauriston Stephen, Ph.G..	1892	Green, Franklin Theodore.	1908
<i>Los Angeles.</i>		Hammar, Alrick, Chief Pharmacist, U. S. Navy.	1897
Binz, Edward Gabriel.	1909	Headen, Claude Thomas, Ph.C..	1909
Carter, Fred Louis.	1905	Jorgenson, Arthur Lawrence Theodore.	1916
Ford, Charles Mangan.	1887	Lackenbach, Fred Isadore, Ph.C.	1907
Lindvall, Charles Gustaf.	1897	Lengfeld, Joseph Louis.	1909
Maas, Arthur R.	1916	McLain, Percy L.	1921
Reilly, Robert C.	1901	Nish, Frederick William.	1916
Sauvinet, Charles D.	1902	Poehner, Adolf Adam, Ph.G., M.D.	1907
Schiff, Ludwig.	1912	Roehr, Clarissa May (Miss).	1908
Stabler, Lavid J.	1915	Sharp, Solomon A.	1902
Thoroman, R. R.	1920	Wenberg, Samuel Ernest.	1922
<i>Mare Island.</i>		White, Jennie M.	1914
McLean, Walter Graham.	1920	Winter, James Henry.	1904
<i>Mountain View.</i>		<i>Sanger.</i>	
Wagner, Louis.	1908	Brehler, Oscar August.	1909
<i>Oakland.</i>		<i>San Jose.</i>	
Correia, Mary Ellen.	1921	Doerr, Louis.	1917
Leet, Robert Andrew.	1907	Dore, Cornelius W.	1915
Philip, Waldemar Bruce, Ph.G., Phar.D.	1907	Pellerano, Nicholas Andrew.	1909
Varney, Edward Francis.	1892	<i>San Leandro.</i>	
<i>Pasadena.</i>		Thomas, Tony B.	1916
JAMIESON, THOMAS NEVIN.	1903	<i>Santa Cruz.</i>	
<i>Patton.</i>		Morre, David Charles.	1921
Dyna, Carl Frederik Julius, Ph.G.	1909	<i>Sebastopol.</i>	
		Worth, Thomas Renfro.	1099

CALIFORNIA—COLORADO—COLUMBIA, DISTRICT OF.

Stanford University.

Merner, Paul Marcus..... 1915

South Pasadena.

Taylor, Walter T..... 1922

Vacaville.

Farrell, Anna Marie (Miss)..... 1914

Ventura.

Newby, Thomas S..... 1916

COLORADO.

Akron.

Van Liew, William Kirk..... 1913

Central City.

Davies, Llewellyn Powell..... 1891

Colorado Springs.

Meyer, Walter Ferdinand..... 1913

Denver.

Ajer, Arche G..... 1920

Best, John..... 1866

Beukma, William..... 1913

Clark, Alfred William..... 1908

Clayton, Charles J..... 1905

Cordes, Henry..... 1913

Engle, Wilber Dwight..... 1917

Hensel, Samuel Theodore, Ph.G. 1913

Hover, William Adgate..... 1895

Hover, William Tracy..... 1913

Jeancon, Louis Augustus..... 1912

Lord, Frank Jotham..... 1912

Morrison, Clee Lane..... 1921

Patterson, Anne M..... 1915

Pillsbury, Arthur Lee..... 1914

Ryan, Alonzo S..... 1913

Scholtz, Edmund L..... 1909

Secheverell, Hugh Bennett..... 1913

Swoboda, Adolph..... 1909

Tobin, Sister Mary Andrew..... 1922

WALBRACH, ARTHUR..... 1881

Watson, Robert Gordon..... 1916

White, Roy Allen..... 1920

Wilson, Lincoln..... 1910

Witting, Frederick Frank, Ph.G. 1902

Englewood.

Crysler, Edwin Walter..... 1921

Fort Collins.

Scott, Alexander Weir..... 1906

Fowler.

Palmer, William Gordon..... 1909

Lafayette.

Dow, John Peter..... 1904

Lamar.

Woods, Samuel Ross, Ph.G..... 1913

Leadville.

McKenzie, Robert Henry, Ph.G. 1908

Pueblo.

Mortenson, Frank Emil, Ph.G... 1910

COLUMBIA, DISTRICT OF.

Washington.

Alsberg, Carl L., A.B., A.M.,

M.D..... 1912

Beall, Herbert Ninian..... 1915

Beucler, William George..... 1915

Bradbury, Wymond Henry,

Phar.D..... 1895

Brown, Clark L..... 1911

Cannon, Claude C..... 1920

Davis, William E..... 1916

Doran, James M..... 1921

DuMez, Andrew Grover..... 1915

Easterday, Herbert Clifton..... 1920

Flemer, Lewis..... 1895

Fuller, Henry Corbin..... 1915

Garrels, Charles..... 1914

Grimss, William Laurence..... 1920

Henry, Frank Clinton..... 1894

HILTON, SAMUEL LOUIS, PHAR.D. 1890

Kalusowski, Henry E..... 1904

KEBLER, LYMAN FREDERIC..... 1894

Kerfoot, William T..... 1920

LaGrange, John V., A.M., Ph.G. 1905

Mayo, Redmond..... 1918

Megaw, Herschel..... 1917

Murray, Alexander G..... 1920

O'Brien, Daniel Joseph..... 1920

POWER, FREDERICK BELDING..... 1872

Quigley, Richard Lucien..... 1902

Rabak, Frank..... 1905

Richardson, Willard Stowell.... 1900

COLUMBIA, DISTRICT OF—CONNECTICUT—DELAWARE—FLORIDA.

SCHAFFER, CHAS.....	1903
Sievers, Arthur.....	1906
Silvester, Paul.....	1922
Smyser, Bert Alexander.....	1918
Spies, Gilbert Eugene.....	1920
Stevenson, Arthur Earl.....	1912
Stockberger, Dr. Warren W.....	1914
Stone, Frank Taylor.....	1918
Suter, Arthur Lee.....	1915
Vane, Patrick P.....	1911
Viehoever, Arno, M.D.....	1915
Wiley, Harvey Washington.....	1902

CONNECTICUT.

Bridgeport.

Damtoft, Knud J.....	1916
Leverty, John Augustine.....	1900
Ostrosky, Frank Joseph.....	1910

Derby.

Purdy, Harrison E.....	1916
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Hartford.

Bienstock, Samuel.....	1916
Donahue, Sister M. Euphemia.....	1922
Gladding, Curtis Parsons.....	1912
Glassman, Albert M.....	1922
Gorman, Chas. F.....	1916
Hockert, Bruno E.....	1916
Pierce, Burritt Hill.....	1921
Sagarino, Rocco J.....	1920

Meriden.

Pink, Charles H.....	1916
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Middletown.

PITT, JOHN RICHARD.....	1872
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New Haven.

GESSNER, EMIL ADOLPH.....	1878
Hoff, Karl Wm.....	1917
Hull, Chas. T.....	1918
Hussion, Walter A.....	1922
Jenkins, Edward H.....	1913
Noyes, Charles Warren.....	1922
Wood, James Prior.....	1890

New London.

Ginsberg, Julius.....	1917
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Noroton.

Gilbert, Cyrus Thurston.....	1913
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Norwich.

Ricker, William D.....	1922
Sisk, Franck A.....	1922

Southport.

Switzer, Luin Burt.....	1916
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Stamford.

Weicker, Theodore.....	1905
Winski, Frank B.....	1916

Terryville.

Viering, Edward Alois.....	1921
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Waterbury.

Ebbs, John Buddington.....	1922
Newton, Clark H. W.....	1916
Wilcox, Levi, Ph.B.....	1903
Xavier, Sister M.....	1922

Willimantic.

Cartier, Gustave O.....	1913
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Winsted.

Barrett, Leslie Burns.....	1921
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DELAWARE.

Seaford.

Kaufman, Reuben M., Ph.G.....	1909
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Wilmington.

Bosley, John Oliver.....	1918
WATSON, HERBERT KENNEDY....	1884

FLORIDA.

Daytona.

Seaman, Frederick Anthony.....	1905
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De Land.

Fisher, George Washington.....	1893
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Fort Myers.

Hunter, N. H.....	1918
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Jacksonville.

Chelf, Roy N.....	1918
Ramsaur, David Wilfong.....	1902

Lakeland.

Lemasters, William Otterbein....	1905
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Miami.

Parnell, Wallace B.....	1920
Perry, Wm. George.....	1918

FLORIDA—GEORGIA—HAWAIIAN ISLANDS—IDAHO—ILLINOIS.

Ocala.

Parrish, Joseph Gid. 1921

Pensacola.

Hannah, Malcolm E. 1914

Petterson, Ernest Wilhelm. 1905

Russell, Hamilton. 1918

White, Walter H. 1918

St. Augustine.

Coe, E. G. 1920

St. Petersburg.

Apple, Mrs. Mary E. 1921

Tallahassee.

Henry, Arthur Malcolm. 1913

Tampa.

Berger, Ernest. 1902

Hale, Leon P. 1918

McMullen, G. A. 1920

Monroe, Harley R. 1916

GEORGIA.

Americus.

Murray, Emmett L. 1920

Athens.

Wilson, Robert C. 1915

Atlanta.

Bliss, A. Richard, Jr. 1919

Gately, Fannie L. R., Mrs. 1920

Jacobs, Sinclair Sartorius. 1915

Augusta.

Land, Robert Henry, Jr. 1902

Macon.

Meaders, Thomas Arthur. 1921

Nicholls.

Thompson, William Daniel. 1920

Pelham.

Taylor, Willie Guss. 1921

Savannah.

Rowliniski, Robert Antone. 1892

Solomons, Isaiah Abraham. 1894

Solomons, Isaiah, Jr. 1913

Thomasville.

Mash, Henry Terrell, Jr. 1917

Thomas, Robert, Jr. 1888

Vidalia.

Page, Orion. 1921

HAWAIIAN ISLANDS.

Honolulu.

Smith, George Waterman. 1915

IDAHO.

Boise.

Ballou, Clarence Orlando. 1909

Gleason, David J. 1916

Lewiston.

Wright, Marshall M. 1921

Montpelier.

Moore, Herbert M. 1921

Pocatello.

Buehler, John J. 1913

Leonard, Eugene O. 1920

Whittlesey, Henry Hawley. 1910

Shoshone.

Carter, Charles. 1921

Twin Falls.

Spargur, Roy Miles. 1910

ILLINOIS.

Alton.

Barth, August F. 1920

Arcola.

Magnusson, Albert. 1920

Arlington Heights.

Altstadt, Benjamin W. 1917

Aurora.

Benton, L. N. 1918

Chawgo, Harry E. 1922

Eberly, Ralph Milton. 1918

Fraenhoff, Frederick Louis, Ph.G. 1909

Funk, Herbert E. 1921

Harris, Warren Frank 1920

Staudt, Louis Carl, Ph.G. 1890

Terry, Ralph Eugene 1920

Batavia.

Schreiner, Albert. 1914

ILLINOIS.

<i>Beardstown.</i>		Behrens, Frederick Francis	
Denton, W. S.	1920	Ferdinand	1920
<i>Berwyn.</i>		Belleza, Edgard C.	1920
Black, Willis E.	1920	Berardi, James B.	1921
Tuma, Charles P.	1921	Bignold, Wilfrid James.	1921
<i>Blue Island.</i>		Bleiweiss, Sydney	1921
Dorjahn, John A.	1921	Block, William	1920
<i>Brookfield.</i>		Blocki, John	1909
Corleto, Joseph Frank	1921	Bodemann, Wilhelm	1906
<i>Buffalo Prairie.</i>		Boehm, John J.	1905
Childs, Frank Samuel	1920	Bornhoeft, John Edward Henry	1921
<i>Cairo.</i>		Borovik, Geo. S.	1921
Lehning, Fred P.	1919	BORUCKI, EDWARD A. F.	1920
Schuh, Herman C.	1916	Boyer, Alden Scott	1919
Thomas, Frank	1920	Bradley, James F.	1921
<i>Canton.</i>		Brann, Wm. Paul	1921
Webster, Richard C.	1914	Brockhoff, Lewis Paul	1919
<i>Carlinville.</i>		Brown, F. W.	1920
Graham, Frank William	1916	Bruun, Harold Nichalai	1905
<i>Chicago.</i>		Burda, Stanislaus W.	1916
Abrahamson, Carl	1918	Burdick, Alfred S., M.D.	1913
Ackermann, Albert George, Ph.G.	1909	Burdick, Merle M.	1913
ADAMICK, GUSTAVE HATTEN-		Buss, Oliver C.	1915
HAUER	1891	Byers, Floyd Marion	1921
Adams, William Thrall	1920	Caldwell, A. C.	1915
Ahlborn, Frank H.	1918	Calomino, Anthony Francis	1920
Alex, Frank	1921	Canham, George E.	1915
Alexa, Anthony Joseph	1921	Christensen, Henry C.	1906
Anderson, G. L.	1920	Chwatal, John J.	1916
Antonides, Edward F.	1921	Clark, Albert Henry, Ph.G.	1905
Antonow, Samuel L.	1918	Cohan, Jacob Joseph	1918
Avery, Charles Hamilton	1905	Combs, Delta E.	1911
Backus, E. J.	1913	Corson, George	1920
Baeslau, Wm. F.	1921	Covnot, Moses Philip	1921
Baker, Samuel L.	1919	Crowley, James Patrick	1908
Bangert, Howard Wells	1919	Curshan, Marcus	1920
Bangert, Louis Edward	1919	DAY, WILLIAM BAKER, PHAR.M.	1895
Bartlett, James E.	1906	Dinnsen, Harry N.	1920
Barton, Paul Elzevir	1921	Doherty, Daniel Joseph	1921
Beavo, Mabel S. (Mrs.)	1918	Donaberg, Sam B.	1921
Becker, Irwin Atwood, B.S.,		Druehl, Amanda Stahl	1916
Ph.G.	1905	Dubsky, Ella K.	1920
Begale, Frank	1920	Dubsky, Frank J.	1918
		Dubsky, Joseph E.	1918
		Dyniewicz, Hattie Adela (Miss)	1919
		Dyniewicz, Josephine Marion	
		(Miss)	1919
		Eckart, Henry C.	1920

ILLINOIS.

Eftaxopoulos, Constantine S....	1920	Hottinger, Otto George.....	1910
Eisenberg, Ira Isadore.....	1920	Hunsche, Frederick.....	1915
Elisburg, Louis A.....	1913	Hurdle, Glen F.....	1921
Erickson, Eric John.....	1920	Hynes, Jeremiah A.....	1920
Fallon, Walter Raymond.....	1921	Irvine, Ephraim D.....	1921
Fantus, Bernard, M.D.....	1908	Janda, Joseph.....	1921
Fenger, Frederic.....	1910	Jaworski, E. W.....	1920
Fenn, Kenneth N.....	1921	Jennings, Ralph Crawford.....	1915
Fingl, Anton W.....	1920	Jensen, Harry Jesse.....	1921
Fox, Milton Mitchell.....	1921	Kachinskas, John T.....	1921
Friedlander, Benjamin.....	1921	Kaplan, Samuel Solman.....	1918
Froiland, Miss Dina.....	1921	Kara, Frank V.....	1920
Fry, Herman.....	1902	Karel, Louis.....	1920
Fry, Narcys George.....	1906	Katz, Isadore I.....	1921
FULLER, OLIVER FRANKLIN.....	1869	Kelch, Henry Carl.....	1921
Galloway, J. B.....	1917	Kemp, Ervin F.....	1920
Gathercoal, Edmund Norris....	1905	Kite, Barney.....	1921
Gazzolo, Frank Henry.....	1917	Knight, Chas. G.....	1918
Geisler, C. A.....	1921	Kochanski, Stephen B.....	1922
Gibney, E. Paul.....	1918	Kogon, S. P.....	1918
Ginsburg, Morris.....	1921	Kolar, Gustav S.....	1918
Ginsburg, Sylvia (Miss).....	1918	Kolar, Stanislav M.....	1921
Glick, Benjamin.....	1921	Kolb, Philip Jacob.....	1918
Gordin, Henry Mann, Ph.D....	1899	Kollar, Zdenek.....	1922
Gordon, Jean (Miss).....	1914	Kovarik, Victor B.....	1921
Gorham, Louis Andrew.....	1921	Kozlowski, Boleslaw.....	1919
Gray, James Herbert.....	1921	Kraemer, Frank W.....	1918
Gray, Margaret McClintock (Mrs.).....	1901	Kraemer, George Charles.....	1913
GRAY, WILLIAM.....	1892	Krizan, John.....	1918
Grossman, David P.....	1921	Krupkin, M. A.....	1922
Guerrieri, Philip A.....	1920	Kulis, Justin.....	1921
Guinter, Seward Haise.....	1920	Kunkel, A. Wayne.....	1919
Gundlach, Edward.....	1920	Kurrasch, Albert A.....	1918
Haas, Otto J.....	1920	Ladish, Erich Herman.....	1905
Haering, Geo. V.....	1918	Larsen, L. P., Ph.G.....	1908
Hart, John M.....	1921	Lesser, Hyman N.....	1920
Hartwig, Otto Julius.....	1892	Levinson, Leo. D.....	1921
Haselberger, Charles Frank....	1920	Lightfoot, Baxter Elijah.....	1920
Hellmuth, Joseph Anthony.....	1905	Lilly, Thomas P.....	1921
Henriksen, E. Fred.....	1921	Linke, Richard Arthur Gustav...	1920
Henry, Samuel Clements.....	1909	Loesch, William, Ph.G.....	1912
Hermanek, Joseph Charles.....	1904	McCabe, Frank J.....	1920
Higgins, Edward C.....	1920	McCausland, Harloven H.....	1913
Hilpert, Willis Stose.....	1908	McCracken, H. S.....	1918
Hirsch, Chas. H.....	1921	Madera, Jaroslav Robert.....	1920
Hoover, George William.....	1905	Maether, Carl A.....	1921
Horn, George.....	1921	Maguire, Andrew.....	1918
		Mahaffy, J. Raymond.....	1920

ILLINOIS.

Mahon, Eber E.....	1921	Secord, George Louis, M.S., Phar.D.....	1910
Mapes, Ralph Clark.....	1921	Shapiro, Leo Harold.....	1917
Mares, Frank Martin, Ph.G.....	1902	Sheblessy, Michael Albert.....	1909
Martin, Lewis Elbert.....	1921	Sides, William Levi.....	1920
Martin, Raeburn LeRoy.....	1921	Silberman, I. Erwin.....	1921
MATTHEWS, CHARLES EDWARD..	1893	Siskel, Maurice.....	1921
Mawrence, Israel.....	1916	Sisson, Oscar U.....	1918
Mendralski, Walter J.....	1921	Sister Mary Wilhelmina.....	1919
Mentz, Otto Herman.....	1916	Skoglund, Herbert.....	1921
Merlak, Frank James.....	1920	Snow, Clyde Mason, Ph.G., M.A.....	1903
Meyer, Frederic Hugo.....	1907	Snyder, Forrest Omo.....	1915
Mick, John George.....	1918	Snyder, William Edward, Ph.G..	1909
Miller, Albert, Ph.G.....	1907	Sorenson, Adolph Waldo.....	1921
MINER, MAURICE A., PHAR.M...	1880	Spagna, Ferdinand A.....	1921
Morrison, Warren Dale.....	1918	Stadelmann, Arthur W.....	1918
Morrisson, James William.....	1912	Stadelmann, Harry Edgar.....	1909
Nichols, William Lee Crosby...	1920	Stanczak, Stanley L.....	1921
Olsen, Egil T.....	1921	Stein, Victor M.....	1921
O'Neill, Wm.....	1918	Stephan, Arthur Harry.....	1921
Patterson, Charles Waggener...	1905	Stephen, Otto Paul, Ph.G.....	1909
Patterson, James A.....	1921	Stieber, F. G. J.....	1918
Petraneck, Joseph Louis.....	1921	Storer, Charles Adelbert.....	1906
Plummer, Cleon K.....	1921	Stotlar, Jo.....	1921
Profant, Otto F.....	1920	Stuchlik, John.....	1913
Puckner, William August, Ph.G., Phar.M., Phar.D.....	1888	Subert, George Anton.....	1921
Rambo, Leon.....	1921	Swanson, Joseph Allen.....	1919
Reiffel, Samuel Jack.....	1921	Sykora, Edward.....	1921
Reinhard, Harold A.....	1921	Tabenski, Longin, Ph.G., M.D..	1915
Rhode, Rudolph Ernst.....	1887	Taylor, Daniel.....	1920
Riemenschneider, Julius H.....	1915	Thompson, Charles Samuel.....	1921
Rimmele, Charles.....	1921	Topf, Jacob A.....	1918
Robinson, Robert.....	1920	Train, Maurice A.....	1921
Roeseler, William Theodore...	1921	Trienens, Joseph.....	1915
Ruder, Rose Scheele (Mrs.)...	1918	Vahlteich, Hans Walter.....	1918
Rutledge, Edward Hays.....	1921	Vanderpoel, Cornelius.....	1921
Safranek, Edward J.....	1920	Van Schaack, Cornelius Peter...	1905
Saltiel, Henry Carl.....	1921	Vaupell, George F., Ph.C.....	1915
Sample, Leo E.....	1921	VOISS, ARCADIOUS.....	1901
Sass, Stephen Konrad.....	1905	Von Hermann, Eugene.....	1918
SCHERER, ANDREW, PH.G.....	1884	Vorsanger, Lillian.....	1915
Schmidt, Florian Joseph.....	1918	Waggoner, Athol L.....	1921
Schmidt, Sidney.....	1920	Warner, Carl A.....	1919
Schrage, Frank.....	1918	Warren, Lewis Eugene.....	1909
Schulte, Norma-Claire.....	1921	Waxman, Lewis W.....	1920
Schwaba, John.....	1920	Weireter, John.....	1920
Scott, Ingvard Martinus.....	1920	Weiss, Louis Ralston.....	1921
Searle, C. H.....	1918		

ILLINOIS.

Weiss, Sydney..... 1921
Wheatcroft, John Christopher... 1912
Whidden, Ray Allen..... 1918
Whitney, Maxson Hall..... 1921
Wieczorek, Walter W..... 1921
Wiertelak, Albert P..... 1921
Wilhelm, Werner F..... 1919
Windmueller, Ralph Wm..... 1920
Wolff, Fred..... 1921
Zander, Arthur W..... 1920
Zoeller, Geo..... 1918

Cicero.

Malinsky, George Anton..... 1921
Plzak, Louis Frank..... 1921
Vondrasek, Albert Frank..... 1920

Cowden.

Jones, Harold V..... 1919

Danville.

Baum, William Franklin..... 1915

Des Plaines.

Merrill, Fayette O..... 1920

Dixon.

Sterling, Robert W..... 1920

Du Quoin.

Buerkle, Henry A..... 1920

East St. Louis.

Merker, Chas. F..... 1920

New, Philip..... 1920

Edwardsville.

Delicate, E. A..... 1920

Effingham.

Eiche, Paul..... 1920

Elgin.

McBride, Stanley Edward..... 1920

Schultz, Charles Frederick Wm.. 1911

Elmhurst.

Kappus, George J..... 1920

Mahler, Wm. H..... 1920

Evanston.

Doolittle, Roscoe Edward, B.S... 1909

Lee, John Victor..... 1910

Wells, James Herbert, Ph.G.,

L.L.B..... 1908

Fairbury.

Decker, W. B..... 1920

Fairmount.

Tilton, Claude Enoch..... 1905

Forest Park.

Jacob, Herman Ferdinand..... 1920

Forreston.

Haller, Edward E..... 1920

Freeport.

Just, Julius Frederick..... 1921

Lawson, Chas. E..... 1916

McNess, Frederick Wm., P.D... 1906

Galesburg.

Hamilton, Lew Brown..... 1920

Geneseo.

Ahnert, Max E..... 1921

Stamm, Dante Milton..... 1896

Glen Ellyn.

Utt, Alfred Reuben..... 1919

Greenup.

Conzet, Rufus Warren..... 1904

Herrin.

Skelton, Maurice B..... 1919

Highland Park.

Gsell, Earl W..... 1917

Highwood.

Laegeler, Julius Charles..... 1920

Hillsboro.

Spinner, Louis Charles..... 1921

Jacksonville.

Armstrong, Byron..... 1917

Jerseyville.

Kirby, Thomas Wesley..... 1920

Ware, F. M..... 1920

Joliet.

Lipow, Diana..... 1920

Schick, Sebastian Fabian..... 1918

Kankakee.

Kochler, Walter..... 1921

Kansas.

Barr, Marjorie A..... 1920

ILLINOIS.

<i>Lake Bluff.</i>		<i>Pearl.</i>	
Young, Fred H.....	1913	Garrison, H. Daley.....	1920
<i>Lake Forest.</i>		<i>Peoria.</i>	
Albrecht, Albert.....	1918	Benton, Wilbur Merritt.....	1888
<i>LaSalle.</i>		Eichenberger, William Samuel...	1916
Clancy, William J.....	1915	Geiger, Edward George.....	1920
<i>Lincoln.</i>		Lacey, W. D.....	1920
Knochel, George M.....	1920	Norris, William Peter.....	1918
<i>Lombard.</i>		Owen, Clarence.....	1920
Hjelte, John E.....	1922	Schmid, Ernest A.....	1920
<i>Mascoutah.</i>		Schmidt, A. Elsa.....	1918
Dauber, Curt Louis.....	1913	Weinkauff, Jacob.....	1914
<i>Metropolis.</i>		<i>Peru.</i>	
Humma, Henry Hermann.....	1917	Robinson, Wesley John.....	1921
Van Hooser, Arthur.....	1920	<i>Pesotum.</i>	
<i>Moline.</i>		Hoffman, George Frederick,	
Anderson, Adolph Emil.....	1913	Ph.G.....	1902
Doden, J. R.....	1918	<i>Quincy.</i>	
Sohrbeck, George Wm., Ph.G....	1897	Bartholomew, Henry Hoagland..	1920
<i>Momence.</i>		Brown, W. Edwin.....	1920
Blomquist, Arthur.....	1919	Dickhut, Lawrence August,	
<i>Monticello.</i>		Ph.G.....	1910
Hott, John Farwell.....	1920	Hagemann, William Herman,	
<i>Mulberry Grove.</i>		Ph.G.....	1910
Humphrey, Allen.....	1920	Konantz, William A.....	1916
<i>Mt. Pulaski.</i>		<i>Ransom.</i>	
Connolley, Virgil George.....	1920	Transeau, James W.....	1921
<i>Nashville.</i>		<i>Rock Falls.</i>	
Holston, Clarence E.....	1920	Stoner, Lloyd.....	1921
<i>Neponset.</i>		<i>Rockford.</i>	
Higgins, Charles Louis.....	1920	Carter, Willard Henry.....	1922
<i>Oak Park.</i>		Freburg, Amel E.....	1920
Day, Marietta C. (Mrs.).....	1920	Zuck, F. J.....	1916
Gram, Wm. J. B.....	1918	<i>Rock Island.</i>	
Huston, Lotis Loma.....	1918	Burnside, Carl Bishop.....	1913
Latsis, Harry Hlia.....	1920	Doden, Herbert F.....	1909
McCauley, Charles Edward....	1903	Greenblatt, Benj.....	1918
Wakefield, T. S.....	1920	Hartz, William Theodore.....	1909
Zwick, Mary Hall (Mrs.).....	1914	<i>Sesser.</i>	
<i>Pana.</i>		Gholson, L. E.....	1920
Gossman, Leo John.....	1920	<i>Shelbyville.</i>	
		DeMonbrun, Cecil T.....	1920
		Pate, Clyde M.....	1920

ILLINOIS—INDIANA.

South Chicago.

Wyszynski, Walter H. 1916

Sparland.

Formhals, Wallace Joseph 1919

Springfield.

Dodds, Frederick Clinton 1918

Gaffney, Randolph Ellison 1920

Metzger, Fred. W. 1916

Rauth, Fred W. 1920

Sister Theresa 1917

Sivia, Jerome 1912

Staunton.

Webster, Cyrus Christopher 1920

Streator.

Cate, Rollin L. 1920

Hattenhauer, Walter B. 1920

Stronghurst, Henderson Co.

Harter, Isaac Foster, M.D. 1893

Tuscola.

Stacy, Marion Franklin 1903

Urbana.

Beal, George Denton 1907

BEAL, JAMES H., Sc.D., PHAR.D. 1892

Bennett, George M. 1918

Creighton, Mary L. (Miss) 1903

Elliott, Victor Alfred 1919

Waukegan.

Breves, Rudolph 1916

Neville, Mark Eldon 1921

Western Springs.

Keil, Julius Martin 1920

West Frankfort.

Lishinsky, Mrs. R. Waitzel 1922

Wheaton.

Dollinger, Charles A. 1920

Wilmette.

Rennekar, Clarence E. 1920

Winslow.

Niemeyer, John 1920

INDIANA.

Attica.

Crigler, Thos. B. 1922

Bloomington.

Wiles, Wood 1914

Bluffton.

Stout, Marion Alphon, Ph.G. 1906

Broad Ripple.

Taylor, Irvan E. 1917

Converse.

Gift, Wendell J. 1913

Elkhart.

Beardsley, Andrew H. 1913

Evansville.

Bohn, George W. 1907

Brown, George Wilton 1914

Eberle, Herman Theodore 1901

Hardigg, William L. 1913

Rogers, Edw. 1902

Ft. Wayne.

Emanuel, Julia Esther (Miss) 1918

Gary.

Hanley, Harry G. 1920

Honorof, Peter 1918

Kobylanski, John Francis 1918

Meyer, Frank B. 1918

Sampanis, Argirio Georges 1920

Goodland.

Cooke, Lawson J. 1922

Hammond.

Ostrowski, Bernice A. 1920

Smith, Ira J. 1921

Steinhardt, Benjamin 1919

Indianapolis.

Bartholomew, William C. 1913

Bibbins, Francis Eugene, Ph.G. 1909

Blodau, Robert P. 1908

Borst, Harry J. 1917

Burrin, Philo LaMont 1919

Carter, Edgar B. 1916

Carter, Frank Henry 1891

Carter, Harlem Wilson Searight. 1913

INDIANA.

Eberhardt, Ernest Godlove, Ph.G.....	1906	<i>La Porte.</i>	MEISSNER, FREDERICK WILLIAM, JR., Ph.G.....	1890
Eckler, Charles Ralph.....	1903	<i>Logansport.</i>	Hoffmann, George William.....	1904
Eldred, Frank Randall.....	1905	<i>Martinsville.</i>	May, Edwin W.....	1914
Etter, Robert B.....	1917	<i>Notre Dame.</i>	Green, Robert Lee.....	1906
Fisk, Frank Byron.....	1916	<i>Rushville.</i>	Wilson, Charles Frazee.....	1906
Fitzkee, Hastings.....	1918	<i>Salem.</i>	Rudder, William Hiram, Ph.G....	1907
Huder, Henry J.....	1894	<i>Seymour.</i>	Loertz, Carl Edward.....	1907
HURTY, JOHN NEWELL, M.D., PHAR.D.....	1882	<i>South Bend.</i>	Osterman, Henry.....	1914
Kassulke, August.....	1905	Reyer, Emil, Ph.G.....	1907	
Keene, Bernard M.....	1918	Tomaszewski, Marian.....	1920	
Leth, Eric Gunnar.....	1916	<i>Terre Haute.</i>	Zimmerman, Theophilus.....	1914
Lilly, Eli.....	1906	<i>Troy.</i>	Gaesser, Theobald Theodore, Ph.G.....	1901
Lilly, Josiah Kirby.....	1890	<i>Valparaiso.</i>	Carpenter, Allie Thomas.....	1921
Lilly, Josiah Kirby, Jr.....	1916	Cox, Cyrus L.....	1919	
Lynn, Charles Jackson.....	1906	Heineman, Albert F.....	1905	
Miller, Ivy Lowell.....	1912	Muldoon, Hugh Cornelius, Ph.G..	1913	
Mueller, J. George.....	1906	Peschel, Peter L.....	1921	
Niles, Edward Hulbert.....	1914	Schicks, George Charles, Jr.....	1921	
Noel, Harry Sumner.....	1917	<i>Warren.</i>	Hickerson, William Henry.....	1894
Parker, Mayne E.....	1915	<i>West Lafayette.</i>	Gidley, Wm. Francis, Ph.C., B.S.....	1910
Pfafflin, Henry Adolph.....	1892	Hess, Leon Ralph.....	1916	
Pruyn, Murry K.....	1912	Sienkoemper, Otto.....	1920	
Reick, Edward C.....	1918	<i>West Terre Haute.</i>	Cassaday, Burton.....	1909
Rice, Ward Jennings.....	1920	<i>Winchester.</i>	Reid, Charles E.....	1922
Seybert, John Edward.....	1916			
Showalter, Ralph W.....	1913			
Smith, Herbert Alexander.....	1917			
Stahlhuth, Ernst.....	1919			
Stucky, Edward W., Ph.B., A.M.	1908			
Thorburn, Albert David.....	1902			
Thurston, Emory W.....	1915			
Vestal, John Wilfred.....	1916			
Warner, Cortice M.....	1916			
Werner, William F.....	1908			
Wright, John Shepard.....	1916			
<i>Kouts.</i>				
Benkie, John Gottlieb.....	1910			
<i>Lafayette.</i>				
Best, Frank Merrell.....	1914			
Jordan, Charles B., Ph.C., B.S., M.S.....	1909			
Lee, Charles O.....	1915			
Yeager, Emory James.....	1918			

IOWA.

IOWA.

Albert City.

Werner, Carl Ali Anderson..... 1922

Albia.

Gross, E. Orville..... 1916

Algona.

Falkenhainer, Albert..... 1916

Allerton.

Heiston, Percy K..... 1921

Amana.

Miller, Frederick William..... 1902

Ames.

Judisch, George..... 1913

Motley, Emery Tyler..... 1920

Bagley.

Phillips, William J..... 1921

Battle Creek.

Rickman, Elmer Henry..... 1921

Burlington.

Sutter, Raymond Otto..... 1922

Callendar.

Larson, Martin..... 1906

Cedar Rapids.

Beezley, Ernest L..... 1921

Fencel, Frank N..... 1922

Grimm, Harold A..... 1920

Meister, Edward James..... 1918

Clinton.

Hendrix, Norburg Thornton..... 1921

Council Bluffs.

Giese, Maude V..... 1922

Corydon.

Shepard, Mrs. Anita..... 1921

Davenport.

BALLARD, JOHN WINTHROP,
Ph.G..... 1871

Denniston, Myron D..... 1921

Emlis, Arno F..... 1922

Ross, Otto Ellsworth, Ph.C.,
Ph.G..... 1908

Wertz, Eddie M..... 1921

Wierks, Clarence..... 1918

Deep River.

Cutler, Chester F..... 1922

Denver.

Schoof, John F..... 1922

Denison.

Schlumberger, Anna Babette.... 1913

Schlumberger, Philip August.... 1911

Des Moines.

Berner, Carl Albert..... 1903

Cameron, L. Catharine..... 1922

Galloway, J. Earle..... 1922

Kagy, Elbert O., Ph.G., Ph.C... 1913

Stedman, Harry A..... 1921

Weeks, Carl..... 1915

Dyke.

Anderson, Marius..... 1921

Dubuque.

Zillig, Adam..... 1922

Dunlap.

Hart, Willard Ronald..... 1922

Elkader.

Witt, Wm. John..... 1921

Estherville.

Moser, Carl Amanuel..... 1921

Essex.

Bergen, Seth A..... 1921

Newquist, Mabel Margaret..... 1922

Ft. Dodge.

OLESON, OLAF MARTIN..... 1877

Ft. Madison.

SCHAFER, GEORGE HENRY..... 1871

Gilbert.

Jones, Ralph A..... 1921

Gladbrook.

Foster, Harry Wallace..... 1921

Glidden.

Heidenrich, Arthur C..... 1916

Grand Junction.

Hodoval, Louis C..... 1921

Granville, Sioux Co.

Bachmann, Joseph..... 1922

IOWA.

<i>Grinnell.</i>		<i>Newton.</i>	
Talbott, Arthur D.....	1922	Nollen, G. H.....	1922
<i>Hamburg.</i>		<i>Odebolt.</i>	
Doyle, Clarence Edward.....	1922	Bergren, Elvin R.....	1916
<i>Hedrick.</i>		<i>Oelwein.</i>	
Scott, Raymond Earl.....	1921	Pfeiffer, H. Jacob.....	1922
<i>Holstein.</i>		<i>Osceola.</i>	
Watts, Thomas McCoy.....	1916	Hofstadter, Anna.....	1921
<i>Homestead.</i>		<i>Otley.</i>	
Moershel, William August.....	1921	McKeever, Ren V.....	1922
<i>Hospers.</i>		<i>Paullina.</i>	
Riemersma, James J.....	1921	Blaesser, Walter Andrew.....	1920
<i>Inwood.</i>		<i>Pleasantville.</i>	
Mcgill, Albert Lawrence.....	1922	Dixon, Clyde Peon.....	1921
<i>Iowa City.</i>		<i>Rock Valley.</i>	
Bickal, S. L.....	1921	Brake, Bert Vande.....	1921
BOERNER, EMIL LOUIS.....	1877	Heinrich, Geo. A.....	1922
Cooper, Zada Mary (Miss), Ph.G.	1909	<i>Sac City.</i>	
Hazard, Clarence C.....	1921	Meyer, Marie Verena.....	1921
Kuever, Rudolph A., Ph.G., Ph.C.	1912	<i>Sheldon.</i>	
Morrison, Sherman William.....	1922	Lutjens, Louis H.....	1921
Roberts, Miss Jane E.....	1922	<i>Sioux City.</i>	
Teeters, Wilber John.....	1902	Castle, Lloyd H.....	1922
Weiss, Josephine Mary.....	1920	Hansen, Otto Theodore.....	1922
<i>Keokuk.</i>		SCHERLING, GUSTAV, Ph.G.....	1884
Kiedaisch, George Arthur.....	1904	Singer, A. F.....	1922
<i>Little Rock.</i>		Soper, George M.....	1909
Osterman, Harry R.....	1921	Thompson, Edwin Thomas.....	1913
<i>Mt. Pleasant.</i>		Toller, Adolph J.....	1915
Waugh, Herbert.....	1922	<i>Traer.</i>	
<i>Manchester.</i>		Caslavka, Lewis Bennett.....	1921
Philipp, August C.....	1921	<i>Underwood.</i>	
<i>Morgan City.</i>		Cosh, W. Frank.....	1921
Bourgeois, Harry J.....	1921	<i>Valley Junction.</i>	
<i>Muscatine.</i>		Carmody, Wm. Henry, Jr.....	1922
Halstead, Alice Louisa, Ph.G.		<i>Victor.</i>	
(Mrs.).....	1892	Gwinn, E. H.....	1921
<i>Newmarket.</i>		<i>Wallace.</i>	
Taylor, Glen O.....	1921	Steward, Charles Robert.....	1921
<i>Nevada.</i>		<i>Waterloo.</i>	
Tipton, Wm. L.....	1922	Moore, Thomas James.....	1922

IOWA—KANSAS—KENTUCKY.

<i>Winfield.</i>		<i>Leavenworth.</i>	
Lindley, John Milton, Ph.G.	1901	Snyder, Leo. J.	1921
<i>Yale.</i>		<i>Marysville.</i>	
Stotts, O. D.	1922	Riesen, David V.	1909
KANSAS.		<i>Ottawa.</i>	
<i>Atchison.</i>		Dorsey, Maurice Edward.	1916
Noll, Mathias.	1918	<i>Overbrook.</i>	
Schmitz, Oscar Joseph.	1920	Topping, Arthur Ellsworth, Ph.G.	1904
<i>Beattie.</i>		<i>Plainville.</i>	
McCoy, Emily Josephine.	1920	McEckron, George Milton.	1916
<i>Clay Center.</i>		<i>Republic.</i>	
Bechard, Ina.	1920	Day, Elsie.	1915
<i>Concordia.</i>		<i>Seneca.</i>	
Sorgatz, Francis F.	1920	Jenkins, Winnifred A.	1921
<i>Downs.</i>		<i>Stark.</i>	
Arnold, Peter Elwood.	1920	Deem, David F.	1920
<i>Emporia.</i>		<i>Waterville.</i>	
Morris, David Warren.	1921	Rommel, Otto H.	1920
<i>Everest.</i>		<i>West Branch.</i>	
Bichlmeier, Laurence Anton.	1920	Larson, James E.	1921
<i>Ft. Leavenworth.</i>		<i>Wichita.</i>	
Miller, Leo John.	1921	Chism, John Samuel, Ph.G.	1909
<i>Gypsum.</i>		Cookson, Ellis Wesley.	1921
Schmitter, Jonathan.	1918	Fields, J. Larkin.	1915
<i>Havana.</i>		Wuester, Mary C.	1920
Lindley, Patrick H.	1913	<i>Winfield.</i>	
<i>Hiawatha.</i>		Bird, Richard B.	1910
Brokaw, Rymar Voorhees.	1920	Friedenburg, Maximillian Wil- mer.	1904
<i>Kansas City.</i>			
Lake, Gillis Q.	1918		
<i>Lawrence.</i>		KENTUCKY.	
Dick, W. S.	1920	<i>Anchorage.</i>	
Fiegenbaum, Benjamin F.	1920	Hausgen, Henry Otto.	1915
Havenhill, L. D.	1900	<i>Augusta.</i>	
Kerr, Archibald Victor.	1921	Bertrams, Henry.	1914
Moore, John Thomas.	1888	<i>Bellevue.</i>	
SAYRE, LUCIUS ELMER.	1883	Wyman, Lloyd Rodney.	1920
Spencer, Daniel Hooker.	1920	<i>Carlisle.</i>	
Sterling, Charles Morgan, A.B. .	1911	Watkins, Esla Kennedy.	1921
Varnum, Walter Howard.	1912		
Watson, George Nathaniel.	1910		

KENTUCKY—LOUISIANA.

<i>Covington.</i>		<i>Algiers.</i>	
Kyser, Edward Vernon.....	1918	Calderone, Frank Joseph.....	1921
Pieck, Edward Ludwig.....	1897	<i>Arcadia.</i>	
<i>Frankfort.</i>		Brewer, Bert Augustus.....	1921
Gayle, John William.....	1891	<i>Donaldsonville.</i>	
<i>Hawesville.</i>		Holbrook, E. Bradford.....	1921
Patterson, George Orville.....	1907	<i>DeRidder.</i>	
<i>Irvine.</i>		Irvine, Frank E.....	1921
Lynch, Owen M.....	1921	<i>Gilliam.</i>	
<i>Jeffersonstown.</i>		Whitley, J. F.....	1921
Oatey, Ernest.....	1920	<i>Independence.</i>	
<i>Lexington.</i>		Wilson, William M.....	1921
Brown, Linwood Arnold, Ph.C.,		<i>Kaplan.</i>	
Phar.D.....	1909	Eleazar, E.....	1918
Fuss, Chester George.....	1922	<i>Mandeville.</i>	
Porter, Chilton Scott.....	1914	Stocking, Charles Howard.....	1914
<i>Louisville.</i>		<i>Merryville.</i>	
Buschemeyer, Henry.....	1909	Heard, Stinson Killgore.....	1922
Dilly, Oscar Charles.....	1888	Smith, Denette Weymouth.....	1919
Dimmitt, Addison.....	1895	<i>Monroe.</i>	
Hulskamp, Clara C.....	1918	Collens, John W.....	1915
Hurley, Horace Oliver.....	1907	Sandman, Isaac Percy.....	1921
Isaacs, Edward Gibson.....	1920	<i>Napoleonville.</i>	
JONES, SIMON NEWTON.....	1870	Heno, Charles.....	1921
Miersch, Rudolph Victor.....	1907	<i>New Iberia.</i>	
Mueller, Otto Edward.....	1907	Segura, Jacob S.....	1917
NEWMAN, GEORGE ABNER.....	1866	<i>New Orleans.</i>	
Stoll, Ferdinand Dyonize.....	1920	Addison, Daniel Geo.....	1921
Votteler, William.....	1895	Aimes, Fred W.....	1921
<i>Moorehead.</i>		Allen, Marion.....	1921
Townsend, Fred S.....	1922	Baumann, George F.....	1921
<i>Newport.</i>		Bergeron, Gilbert O.....	1922
Blank, Nicholas J.....	1915	Berner, Joseph Henry.....	1921
Greule, Albert Martin.....	1903	Besse, Fred, Jr.....	1921
Hoyer, Benjamin.....	1916	Bosio, Arthur.....	1920
Widsig, T. J.....	1915	Bouee, John R.....	1921
<i>Owensboro.</i>		Bouvier, Clovis J.....	1921
Danhauer, William Edward.....	1914	Breen, Morris.....	1921
<i>Paris.</i>		Breslin, Arthur E.....	1921
Snapp, Elbridge Lee.....	1920	Brown, Geo. S.....	1922
LOUISIANA.		Brown, Hugh A.....	1921
<i>Alexandria.</i>		Capdan, Hypolyte E.....	1919
Joseph, Edward Isaac.....	1921	Casteix, Martial B.....	1921

LOUISIANA—MAINE.

Catalano, A.....	1921
Catalano, John.....	1921
Clay, Cassius Lovelace.....	1918
Commagere, Louis E., Jr.....	1921
Coochiara, Anthony S.....	1921
Danneker, John Martin.....	1922
D'Aunoy, Jerome Emmanuel....	1921
Doucet, W. E.....	1921
Duplantis, Wilsey P.....	1921
Elmer, Oscar Baker.....	1918
Flach, August Charles.....	1921
Freund, Paul.....	1917
Galle, Joseph Ernest.....	1921
Godbold, Fabius Chapman.....	1887
Grace, Robert F.....	1914
Grasser, John J.....	1918
Hart, E. J.....	1921
Jacobs, Elliott.....	1921
Jahn, Mrs. Margaret.....	1920
Jensen, Roy C.....	1921
Kaczoroski, Adolph O.....	1909
LeBlanc, Lawrence J.....	1921
Legendre, Joseph Amilcar.....	1891
Loubat, Walter L.....	1921
Lyons, Lucien Eugene.....	1904
McDuff, George W.....	1921
Morvant, John S.....	1921
Naylor, Hugh Custer.....	1921
Nuccio, Frank Joseph.....	1918
Nutter, Albert M.....	1919
Otto, John Nicholas Washington.	1919
Richards, Henry Cook.....	1921
Robert, James L.....	1921
Samson, Max.....	1900
Schertz, Christian.....	1916
Treece, Wilfred W.....	1921
Walsdorf, Edward H.....	1904
Welsch, Henry.....	1916
Whisenhaut, Nathaniel Lyon....	1921
Wirth, Adam, Ph.M.....	1904
Worner, William August.....	1921
Wunderlich, Edward.....	1891

Plaquemine.

Comeaux, Albert J.....	1921
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Shreveport.

Pachomius, Sister Mary.....	1922
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Slidell.

Cohen, Harry.....	1921
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Winnfield.

Brorch, Mach Lunsford.....	1920
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MAINE.

Auburn.

Jones, Oscar Winthrop.....	1902
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Augusta.

Coughlin, John.....	1908
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Partridge, Frank Reuben.....	1895
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Bangor.

Davis, Charles Howard.....	1903
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SWEET, CALDWELL.....	1881
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Biddleford.

Fortin, Emile A., M.D.....	1916
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Danforth.

Porter, Martin Luther, M.D....	1904
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Dexter.

Bullard, Morton Leonard.....	1917
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Fort Fairchild.

Buxton, Horace Childs.....	1910
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Houlton.

Saunders, Vernon Dewellyn.....	1921
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Kennebunk.

Meserve, Albert Wesley, A.M.,	
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B.A.....	1905
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Lewiston.

Babcock, Percival Warren.....	1909
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Mathews.

Hawkins, John M.....	1915
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Portland.

Broe, James Augustin.	1917
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Cook, Alfred Page.....	1902
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Dickson, Edmond C.....	1921
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FRYE, GEORGE CARLTON.....	1879
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Hay, Edward Allston.....	1899
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Rankin, George W.....	1915
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Tuttle, George O.....	1907
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Richmond.

McKenney, Frank Roy.....	1914
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MAINE—MARYLAND.

<i>Sanford.</i>			Lowry, William J., Jr.	1906
Thompson, Clarence.	1920		Meyer, Charles Lewis.	1901
<i>South Paris.</i>			Moose, Walter Lee.	1920
Howard, Chas. H.	1915		Morgan, Charles.	1899
<i>Waterville.</i>			Mossop, Carrie Gray.	1920
Davian, Emile Hector.	1921		Muehlaue, Otto W.	1915
King, Fred.	1921		Murphy, Jerome Edward.	1922
<i>Yarmouthville.</i>			Muth, George Giustiniani.	1906
Ring, Harry E.	1916		Muth, John Clement.	1898
MARYLAND.			Neal, Charles Chaplin.	1906
<i>Baltimore.</i>			Quillen, Joe Willard.	1920
Albert, Arleigh Hubert.	1922		Ragland, Thomas Ellsworth.	1920
Barone, James A.	1922		Roberts, Jos. C.	1910
Base, Daniel, A.B., Ph.D.	1898		Schlosser, Roy B., Ph.G.	1916
Belbot, Emma N.	1922		Schricolter, Morris E.	1920
Black, James Aitken, Phar.D.	1910		Schulze, Louis, Ph.G.	1892
Boyles, Frank Morris.	1914		Schulze, Wilmer H., Phar.D.	1916
BRACK, CHARLES EMIL.	1876		Smith, Theodor.	1890
Burroughs, Horace, Jr.	1921		Sonnenburg, Amelia Adelaide.	1918
Cole, Bessie Olive (Miss).	1915		Stickels, Arthur Elmer.	1920
Colson, Henry C., Jr.	1917		Sullivan, John Patrick.	1909
Cook, Parker.	1910		Thomas, John Benjamin.	1906
CULBRETH, DAVID MARVEL REY-			Walz, Jacob Lee.	1906
NOLDS, M.D.	1883		Westcott, James Walling, Ph.G.	1890
Dickson, Frederick W.	1906		Wich, Henry Edward.	1909
Dohme, Alfred Robert Louis.	1891		Williams, Lawrence Soper.	1910
Donnet, John Smith.	1915		WINKLEMAN, JOHN HENRY.	1864
Dunning, Henry Armit Brown,			Woehner, Walter Albert.	1918
Phar.D.	1902		Wolf, Charles Augustus.	1906
Englehardt, Hermann.	1907		Wolf, James Carlton.	1905
Fouch, William M.	1906		<i>Cumberland.</i>	
Frames, John Fuller, Ph.G.	1890		Holtzmann, Charles Hanson.	1911
Gaver, Gaither C.	1921		<i>Edgewood Arsenal.</i>	
Gilpin, Henry Brooke.	1889		Webber, M. Elbert.	1920
Hancock, James Etchberger.	1907		<i>Frederick.</i>	
HANCOCK, JOHN FRANCIS.	1863		Pearre, Albert Lindsay.	1906
Harris, Samuel Y.	1920		Williamson, Thomas M.	1916
Hetz, Edwin.	1921		<i>Frostburg.</i>	
Heusler, Philip Ignatius.	1903		Pearce, George Ellsworth.	1911
Hindes, Joseph Frey.	1910		<i>Hagerstown.</i>	
Hodson, Eugene Withers.	1907		Meredith, Harry Lionel.	1900
Kantner, Leahmer M.	1914		Schindel, David P.	1914
Kelly, Evander Frank, Phar.D.	1905		<i>Mt. Rainier.</i>	
Kranz, John Christian, Jr.	1920		Spire, William Barton, Phar.D.	1908
Lotz, Emma Grace.	1916			

MARYLAND—MASSACHUSETTS.

<i>Salisbury.</i>	
White, Edward Riall.....	1911
<i>Sharptown.</i>	
Bennett, Howard S.....	1920
<i>Snow Hill.</i>	
Powell, William Cottingham.....	1895
<i>Sykesville.</i>	
Swain, Robert Lee.....	1909
<i>Taneytown.</i>	
McKinney, Robert Sentman, Ph.G.....	1898

MASSACHUSETTS.

<i>Allston.</i>	
Gilmore, Mildred Lillian.....	1919
Griffin, Lyman Whiting.....	1907
<i>Bedford.</i>	
Marks, Wm.....	1920
<i>Beverly.</i>	
Delaney, Thomas F.....	1910
<i>Boston.</i>	
Amrhein, Florin Joseph.....	1915
Bradley, Theodore James.....	1896
Brown, Arthur Nutter.....	1918
Burnett, Benjamin G.....	1922
Burnham, Alfred Augustus, Jr... 1891	
Capetanakis, Demetrios Chris- tow.....	1920
Doliber, Franklin W.....	1914
Ewing, Clare O.....	1918
Finneran, James Francis.....	1906
Geddes, Lillian M. (Mrs.).....	1912
GODDING, JOHN GRANVILLE, Ph.G.....	1875
Goodwin, Howard.....	1910
Hunt, Reid.....	1904
Lyons, Michael Francis.....	1910
McIntire, Martin J.....	1910
Merrill, Edward C.....	1914
Monnier, Ernest.....	1913
O'Brien, James M.....	1910
Sampanis, Argiris Geo.....	1918
Sampson, Claude Howard.....	1921
Shean, Geo. F.....	1921

Smith, Howard Harry, Ph.G., M.D.....		1911
Staehli, Theodore Hermann.....		1912
Tailby, J. Allen.....		1918
Tobin, John J.....		1914
Vargas, Heredis Jorge.....		1891
White, Benjamin.....		1921
Wiggin, Harry Carleton.....		1910
Woodward, Seymour Eastman...		1920
Wooten, Thomas Victor, Ph.G....		1893
Yaffe, Joseph Philip.....		1921
<i>Brockton.</i>		
Braconier, Frank Gunmar, Ph.G.		1916
<i>Brookline.</i>		
Clapp, Lowell Tuckerman.....		1905
Gammon, Irving Parker.....		1906
Glancy, John Douglas.....		1913
Hitchcock, Charles H.....		1910
<i>Cambridge.</i>		
Acheson, Wm. R.....		1910
Hawthorne, Herman Francis...		1909
LaPierre, Eli Henry, Ph.G.....		1892
Norton, George Edward.....		1895
SHARPLES, STEVEN PASCHALL, S.B.....		1875
Stover, Charles Albert, Ph.G....		1909
Thompson, Jennie Elizabeth.....		1921
Thompson, Leon Albert, Phar.D.		1907
<i>Camp Devens.</i>		
Mulford, Henry Kendall, Jr.....		1916
<i>Chelsea.</i>		
Armstrong, Thomas Call.....		1915
Greeley, Randall Horace.....		1920
Marmon, Samuel Manuel.....		1920
<i>Chestertown.</i>		
Stam, Lillian R.....		1919
<i>Chicopee.</i>		
Dalton, Ernest.....		1913
<i>Clinton</i>		
Burdette, Bernard Clarence.....		1911
<i>Concord Junction</i>		
Miller, Gladys B.....		1922
<i>Cordaville.</i>		
Follensby, Edna Mildred Miss		1918

MASSACHUSETTS.

<i>Dedham.</i>		<i>Leominster.</i>	
Mondello, Paul.....	1920	Nixon, Charles Frederick, Ph.G..	1900
<i>Dorchester.</i>		<i>Lowell.</i>	
Archer, Frederick.....	1913	Donoghue, Richard Sheridan....	1910
Kupperstein, Benjamin Robert..	1921	HOOD, CHARLES IRA.....	1871
Steinberg, Leo David.....	1920	Osgood, Winthrop Brancroft....	1920
Williamson, Gordon James.....	1921	<i>Lynn.</i>	
<i>Dorchester Center.</i>		Ellis, Leon Clifton.....	1918
Coleman, George Edward.....	1912	Gannio, Michael.....	1921
<i>East Boston.</i>		Kreisser, Samuel Morris.....	1921
Bemis, Robert Edson.....	1921	Wolff, D. O.....	1916
PACKARD, CHARLES HERBERT....	1906	<i>Malden.</i>	
Woodside, Alva Melville.....	1921	Hershenson, Bert Barnet.....	1921
<i>Edgartown.</i>		Lourie, Samuel.....	1920
Beetle, Susan Russell.....	1921	<i>Marlboro.</i>	
<i>Everett.</i>		Morse, Harry F.....	1921
Wagner, Arthur Carl.....	1907	<i>Melrose.</i>	
<i>Fall River.</i>		Ripley, Henry Milton.....	1910
Brunelle, Albert Joseph.....	1910	<i>Milford.</i>	
Corrigan, Dominick F.....	1912	Pederzoli, Charles Arthur.....	1921
Sharkansky, Eugene Louis.....	1918	<i>New Bedford.</i>	
<i>Fitchburg.</i>		Curry, Geo. Francis, Jr.....	1920
ESTABROOK, HENRY ARTHUR....	1886	Guinn, Rosamond Alice.....	1920
<i>Gloucester.</i>		Robert, Camille Joseph.....	1920
Barker, Fred A.....	1914	SHURTLEFF, ISRAEL HAMMOND... 1875	
<i>Holyoke.</i>		<i>Newburyport.</i>	
Heinritz, Lebrecht Gustav.....	1902	Davis, Charles Leland, Ph.G....	1897
<i>Hudson.</i>		<i>Newton.</i>	
Wheeler, Carlton Bancroft,		Burke, Bernard M.....	1920
Phar.D.....	1907	WILSON, BENJAMIN OSGOOD....	1859
<i>Hyannis.</i>		<i>Newton Center.</i>	
Hawley, Norma C.....	1916	Hahn, William.....	1910
<i>Jamaica Plain.</i>		<i>North Boston.</i>	
Biesty, Patrick Joseph.....	1918	Engstrom, Ernest Oscar, Ph.G... 1906	
Lewis, Ernest Grant.....	1892	<i>North Cambridge.</i>	
Lewis, John Grant.....	1921	Olive, George M.....	1911
Smith, Linville Holten.....	1892	<i>Norwood.</i>	
<i>Lawrence.</i>		Brooks, Frederick Pratt.....	1914
Call, Harry Barrett.....	1909	<i>Quincy.</i>	
Glover, William Henry, Ph.G....	1891	Hearn, Charles Carroll.....	1920
Penn, Abraham.....	1922	<i>Roslindale.</i>	
Penn, Maurice.....	1922	Peterson, Ralph Carl.....	1921

MASSACHUSETTS—MICHIGAN.

<i>Rowe.</i>	
Stanford, Ernest E.	1920
<i>Roxbury.</i>	
O'Hearn, Katherine E.	1920
<i>Sagamore.</i>	
Adams, James Holmes.	1906
<i>Shelburne Falls.</i>	
BAKER, EDWIN.	1875
<i>Somerville.</i>	
Grover, George Elmer.	1910
<i>Southbridge.</i>	
Hartwell, Geo. Henry.	1914
<i>Springfield.</i>	
Bresson, Alfred Frederic.	1916
Leonard, Edward Fenno.	1909
Lerche, Albert E.	1913
Markels, Dorothy.	1921
Thompson, Clifford R.	1916
<i>Stoneham.</i>	
Charkoudian, Leon Nahabed.	1918
Emerson, Herman Lincoln.	1911
PATCH, EDGAR LEONARD, PH.G..	1872
<i>Taunton.</i>	
Crossman, George A.	1872
<i>Three Rivers.</i>	
Horgan, Dennis J.	1922
<i>Uxbridge.</i>	
Gunn, George Baylies.	1917
<i>Waltham.</i>	
Gleason, Patrick Sebastian.	1904
Twombly, A. P.	1918
<i>Watertown.</i>	
Mugar, Alice Louise.	1920
<i>West Medford.</i>	
Shedd, Edwin Walter.	1910
<i>West Roxbury.</i>	
Sumner, Jennie Henrietta (Miss), Ph.G.	1909
<i>Winchester.</i>	
Knight, Frank Herbert, A.B., Ph.G.	1909

<i>Winthrop.</i>	
Stover, Wm. Francis.	1914
<i>Worcester.</i>	
Beaulac, Leo Armand.	1921
Brewer, Howard Dickinson.	1902
Fausnaught, James Cherry.	1920
Fenwick, Harold Benson.	1921
Flint, William S.	1909
Guerin, James Francis.	1898

MICHIGAN.

<i>Ann Arbor.</i>	
Collins, George Wm.	1911
Glover, Clifford C.	1913
Haarer, Oscar.	1917
Ivanoff, Petko Lazaroff.	1913
Wagner, Leonard R.	1915
<i>Big Rapids.</i>	
Jones, Mervin A.	1920
<i>Buchanan.</i>	
Wisner, Ebert H.	1914
<i>Coldwater.</i>	
Lyon, Arthur George.	1909
<i>Detroit.</i>	
Allen, Frank M.	1921
Bailey, LaForrest D.	1920
Behrens, Wilbur J.	1921
Bertram, E. O.	1915
Black, Roderick T.	1921
Blome, Walter H.	1915
Briggs, Clifton Henry.	1914
Burniac, Joseph J.	1921
Buzzell, Arthur L.	1919
Bye, Mortimer.	1916
Campbell, James Clayton.	1919
Chase, Walter M.	1915
Chostner, Grover Cleveland.	1921
Colby, William Frederick.	1921
Crandall, Ernest R.	1920
Crane, George W.	1914
Dox, Howard Stanley.	1920
Drugociu, Nicholas.	1915
Ebner, Frank Gannon.	1918
Edmonds, B. P.	1917
Farwell, Oliver Atkins.	1912

MICHIGAN.

Francis, John Miller, B.S., M.A.	1906	Taylor, Francis Owen, Ph.C.	1912
Frank, Sigmund	1920	Thompson, Frank Augustus,	
Gilbert, Rolland J.	1920	Ph.C.	1908
Gorenflo, Oscar William	1909	Van Poppelm, H. Walter	1921
Graber, Howard T.	1915	Vernor, James	1866
Gratton, Geo. F.	1921	Washburn, Crosby B.	1918
Grommet, Geo. H.	1915	Weaver, Clarence Albert	1909
Hall, William Alanson	1888	Webster, John Hugh, Ph.G.	1911
Hamilton, Herbert C., Chemical		Wegner, Otto William	1921
Engineer	1912	Wheeler, Albert Alton	1906
Hayward, Lawrence Barnes	1912	Williams, John E.	1920
Hight, Macy S.	1917	Wirth, Elmer H.	1920
Houghton, Elijah Mark, Ph.C.,		Young, Andrew Palmerston	1914
M.D.	1889		
Ingram, Frederick Fremont, Jr.	1914	<i>Elk Rapids.</i>	
Jaffa, Philip Walter	1921	Winters, Arthur James	1916
Jones, Ernest Ray	1915	<i>Flushing.</i>	
Kaminski, William A.	1919	Sprague, Wesson Gage	1895
Kamm, Oliver	1921	<i>Grand Rapids.</i>	
Kimmich, Ernest	1914	Jongejan, Cornelius Henry	1910
Kolbe, Emil B.	1914	Kirchgessner, William Carl, Ph.C.	1903
Lakey, Roland T.	1920	Middleton, Louis V.	1919
Lyndrup, Chris	1917	Vellema, Peter	1915
LYONS, ALBERT BROWN	1885		
Mallard, Albert E.	1907	<i>Hersey.</i>	
Mann, Charles Frederick	1903	Delzel, J. T.	1915
Mason, Harry Beckwith	1896	<i>Highland Park.</i>	
Mitschkin, Mark D.	1915	Guffin, Harry Lewis	1921
Moore, John C.	1920	Konzelman, Theodore	1919
Moyer, A. E.	1913	<i>Ionia.</i>	
Nelson, Edwin Horatio	1904	Long, Dennis B.	1921
OHLIGER, LOUIS PHILIP	1871	<i>Iron Mountain.</i>	
Ohliger, Willard	1903	Seibert, George Frederick	1909
Pape, Fred Carl	1921	<i>Jackson.</i>	
Pinkerton, Howard	1914	Way, James E.	1922
Pomerantz, Fulley J.	1921	<i>Kalamazoo.</i>	
Rohnert, Frederick	1915	Hall, George Chalmers	1914
Root, Charles T.	1918	Light, S. Rudolph	1914
Rovin, Alexander M.	1917	Todd, Paul H.	1920
Rowe, Lewis W.	1916	<i>Lansing.</i>	
Russell, Jason L.	1922	Moore, Maxwell S., Ph.G.	1917
Schaupner, John Philip	1915	Raquet, Wallace Allan	1920
Schettler, Geo. M.	1914	<i>Middleville.</i>	
Scott, Frank Genio	1917	Faulkner, Ellis E.	1917
SCOVILLE, WILBUR LINCOLN	1891		
Seltzer, Leonard Adams, Ph.C.	1899		
Smailis, Joseph J.	1919		
Strand, Martin E.	1920		

MICHIGAN—MINNESOTA.

<i>Mt. Clemens.</i>		<i>Canby.</i>	
KRAEMER, HENRY.....	1892	Sather, Clarence.....	1921
<i>Muskegon.</i>		Hanson, Geo. E.....	1922
Koon, Chas. S.....	1915	Nygren, Richard E.....	1922
<i>Redford.</i>		<i>Canton.</i>	
Bradt, Frederick.....	1915	Case, Westwood D.....	1919
<i>Saginaw.</i>		<i>Chisholm.</i>	
Heim, William.....	1916	Casey, Edmund I.....	1918
<i>Sandusky.</i>		Jacobson, Charles M.....	1920
Hoffmann, Herbert H.....	1918	<i>Clara City.</i>	
MINNESOTA.		O'Brien, Frank P.....	1922
<i>Akeley.</i>		<i>Clearwater.</i>	
Malerich, Elizabeth M.....	1920	Phillips, Jennie L.....	1920
<i>Alexandra.</i>		<i>Clinton.</i>	
Holverson, Henry T.....	1909	Howe, Arthur E.....	1920
<i>Argyle.</i>		<i>Cloquet.</i>	
Robertson, Donald.....	1920	Proulx, Emile J.....	1920
<i>Arlington.</i>		Raiter, Roscoe O.....	1921
Sharping, A. W.....	1919	<i>Cokato.</i>	
<i>Atwater.</i>		Swanberg, Theodore.....	1920
Larson, Ned L.....	1920	<i>Currie.</i>	
<i>Balaton.</i>		Kauffman, Dr. Jno. Howard....	1922
Tenhoff, Charles J.....	1920	<i>Dassel.</i>	
<i>Benson.</i>		Busch, Wm. John.....	1922
Clarke, Ward S.....	1922	<i>Delano.</i>	
<i>Big Lake.</i>		Wittman, Albert W.....	1922
Peterson, August.....	1920	<i>Detroit.</i>	
<i>Blooming Prairie.</i>		Carman, J. A.....	1922
Paulson, Roy Grover.....	1922	<i>Duluth.</i>	
<i>Boyd.</i>		Abbett, William Allen.....	1901
Vikre, Sigfred M.....	1920	Anderson, J. August.....	1920
<i>Brainerd.</i>		Anderson, Lawrence M.....	1920
Wallen, Alvin U.....	1921	Byers, Benton Bayard.....	1920
<i>Buffalo Lake.</i>		Grochau, Edward A.....	1920
Eckstein, A. J.....	1920	Jeronimus, Henry Jurgen H....	1920
<i>Butterfield.</i>		Scott, Reuben M.....	1920
Hollenitsch, John W.....	1920	Swanson, Atle E.....	1922
		Vincent, Sister Mary.....	1922
		<i>East Grand Forks.</i>	
		Kingman, Ignatius.....	1917
		<i>Eden Valley.</i>	
		Scott, John Herman.....	1918

MINNESOTA.

<i>Elgin.</i>		<i>Kirkhoven.</i>	
Holton, Fred Addie.....	1922	Ostlund, John L.....	1921
<i>Ellendale.</i>		<i>Lake Park.</i>	
Wardwell, Wilson B.....	1920	Nelson, John.....	1918
<i>Fergus Falls.</i>		<i>Lewiston.</i>	
Beise, John Henry.....	1908	Neumann, John H.....	1918
Lee, Evan C.....	1920	<i>Lindstrom.</i>	
<i>Fertile.</i>		Elfstrand, Wilhelm.....	1905
Demas, Gustave Jules.....	1918	<i>Litchfield.</i>	
<i>Forest Lake.</i>		Anderson, Charles August.....	1920
Bergh, Frank Charles.....	1922	Lofstrom, A. Ernest.....	1920
<i>Frazee.</i>		<i>Little Falls.</i>	
Geisenheyner, Wm. O.....	1922	Brown, Charles Hall.....	1920
<i>Fulda.</i>		<i>Lonsdale.</i>	
Iverson, Ida.....	1920	Lexa, Anastacia M.....	1922
Johnson, M. G.....	1917	<i>Mabel.</i>	
<i>Gilbert.</i>		Jones, Dilwyn W.....	1918
Dukelow, Richard T.....	1918	<i>Mankato.</i>	
<i>Good Thunder.</i>		Steiner, Frank A.....	1918
Seaquist, Oscar William.....	1918	<i>Milaca.</i>	
<i>Grand Rapids.</i>		Baldowsky, Benno Albert.....	1920
Whittemore, Lee A.....	1920	Presley, George A.....	1920
<i>Halstad.</i>		<i>Milan.</i>	
Gilbert, Allen M.....	1920	Opjorden, Claus K.....	1922
<i>Hastings.</i>		<i>Milroy.</i>	
Sieben, Harry A.....	1922	Taplin, Clifford Florian.....	1918
<i>Henderson.</i>		<i>Minneapolis.</i>	
Blasing, Alfred Charles.....	1920	Allen, E. Floyd.....	1885
<i>Hibbing.</i>		Bachman, Gustav.....	1905
Stein, Milton.....	1918	Beadle, Charles Perry.....	1920
<i>Hoffman.</i>		Bercowitch, Jack D.....	1917
Gronberg, H. J.....	1920	Boothroyd, Margaret.....	1920
<i>Hopkins.</i>		Borovsky, Elizabeth.....	1922
Smetana, William S.....	1915	Bruce, Hallie.....	1922
<i>Janesville.</i>		Danek, John Francis.....	1895
Hirscher, Alfred Meade.....	1918	Dargavel, J. W.....	1917
<i>Kasson.</i>		Dooley, Daniel B.....	1918
Anderson, Walter.....	1920	Erkel, Arthur George, Ph.C.....	1910
<i>Kimball.</i>		Esterley, Theodor W.....	1922
Douglass, Addison C.....	1920	Fahlstrom, Adolph A.....	1920
		Fischer, Carl F.....	1921
		Fjeldstad, Alex H.....	1920

MINNESOTA.

Gamble, Stewart.....	1897	<i>New Prague.</i>	
Goldner, John E.....	1918	Holec, Rose Louise.....	1920
Gregg, Henry H.....	1920	Piesinger, Marie A.....	1920
Gregg, Henry Hamilton, Jr.....	1922	<i>New Richland.</i>	
Griffen, Truman.....	1909	Tyrholm, Harold A.....	1920
Havland, Guy Bernhardt.....	1920	<i>Nicollet.</i>	
Hickman, Frank M.....	1920	Borath, Emil H.....	1920
Huhn, Charles Hugo, Ph.C.....	1905	<i>Northfield.</i>	
Hunt, Robert J.....	1920	Martin, M. DeWitt.....	1920
Karnofsky, Charles F.....	1918	<i>North Minn.</i>	
King, George Alexander Newton.....	1892	Loneragan, Maurice Daniel.....	1920
Kline, A. J.....	1918	<i>Ogilvie.</i>	
Kruckeberg, Henry C.....	1920	Conger, Horace Samuel.....	1918
Kusterman, Fred G.....	1918	<i>Olivia.</i>	
Netz, Charles Vail.....	1919	Becker, Herman C.....	1920
Newcomb, Edwin Leigh, P.D.....	1906	Mamer, Bernard.....	1918
Peterson, Hugo O.....	1920	<i>Osakis.</i>	
Petterson, Petter Gabriel.....	1922	Clay, Andrew W.....	1918
Robitshek, Irving H.....	1914	Haywood, George H.....	1919
Rogers, Charles Herbert.....	1914	<i>Owatonna.</i>	
Schackelford, Franklin T.....	1922	Zamboni, Wm. C.....	1922
Spetz, Esther.....	1920	<i>Parkers Prairie.</i>	
Spiegel, Louis.....	1920	Hallin, Emil Erick.....	1920
Strimling, Abraham.....	1919	<i>Pequot.</i>	
Strimling, Wm.....	1919	Rasmussen, Alfred Sophus.....	1902
Stuart, Josephine A. Wanous		<i>Pierz.</i>	
(Mrs.).....	1897	Duncan, Raymond M.....	1920
Sweet, William Herbert.....	1905	<i>Pine River.</i>	
Vogel, Vivian Vina.....	1920	Allen, John Jay.....	1920
Wincott, Robert T.....	1920	<i>Pipestone.</i>	
Wulling, Frederick John, Ph.G.,		Cook, John Walter.....	1920
LL.B.....	1893	Menzel, Max.....	1915
<i>Montevideo.</i>		<i>Preston.</i>	
Arneson, Theodore A.....	1918	Remington, Porter B.....	1920
<i>Moorhead.</i>		<i>Red Lake Falls.</i>	
Tiegen, Hjalmar O.....	1919	Funk, Charles Louis.....	1920
<i>Moose Lake.</i>		<i>Rochester.</i>	
Biscoe, Thomas C.....	1920	Hoffman, Edward L.....	1918
<i>Morgan.</i>		Judd, Cornelius M.....	1918
Gerstmann, Frank.....	1921	<i>Roseau.</i>	
<i>Mountain Lake.</i>		Lauring, C. J. Osean.....	1920
Balzer, Solomon.....	1920		
<i>New London.</i>			
Olson, John P.....	1920		

MINNESOTA—MISSISSIPPI.

<i>Rush City.</i>		Rudeen, Carl John.....	1920
Setter, Harry O.....	1921	Sigler, Wm. H.....	1922
<i>Sacred Heart.</i>		Smith, Frederick Alfred Upsher, Ph.C.....	1907
Nordstrom, Edwin.....	1920	St. Clair, Wesley.....	1920
Stenborg, William Alvin.....	1922	Strate, Herbert A.....	1917
<i>St. Hilaire.</i>		<i>Stillwater.</i>	
Sundholm, Enoch.....	1920	Booren, John, Jr.....	1922
<i>Sandstone.</i>		King, Ira Perkins.....	1919
Coleman, John Harvey Chas....	1920	<i>St. Cloud.</i>	
<i>Sauk Center.</i>		Carter, Benjamin Farrar.....	1922
Dowswell, Oscar Winfield.....	1922	Molitor, Martin.....	1918
<i>Slayton.</i>		<i>Thief River Falls.</i>	
Wulling, Charles Wm.....	1920	Bryant, David K.....	1918
<i>Southbridge.</i>		<i>Two Harbors.</i>	
Hartwell, Geo. Henry.....	1914	Falk, Charles Ferdinand.....	1920
<i>South Haven.</i>		<i>Tyler.</i>	
Pedersen, Jeppe D.....	1922	Vodheim, Joseph.....	1917
<i>Springfield.</i>		<i>Walker.</i>	
Yackel, Arthur J.....	1920	Upham, George Bliss.....	1920
<i>St. Paul.</i>		<i>Warroad.</i>	
Aberwald, Louis James.....	1918	Lundbohm, Victor E.....	1920
Aldes, Antoinette.....	1920	<i>Watterville.</i>	
Baines, Wiley Collins.....	1920	Guilbert, Oliver W.....	1921
Barnett, Samuel Baer.....	1920	<i>Westbrook.</i>	
Burke, William E.....	1920	Steiner, Wm. F.....	1922
Cohler, Sara B.....	1920	<i>Willman.</i>	
Collier, William Kelley.....	1892	Carlson, Arthur E.....	1921
Conger, Frederick Albert.....	1907	<i>Winona.</i>	
Elfenbein, Harold Herman.....	1922	Brown, Edwin A.....	1918
FROST, WILLIAM ARTHUR, PH.G.	1892	Schneider, Wm. Joseph.....	1922
Fuchs, Edmund J.....	1920	<i>Wood Lake.</i>	
Greenwalt, Frances Marion.....	1920	Magnusson, Norman T.....	1920
Hannafoord, Foster.....	1922	<i>Worthington.</i>	
Heller, Charles T.....	1906	Morland, Robert Lawson.....	1909
Jelinek, John Peter.....	1907	Herbert, Miner L.....	1918
Johnson, Hans Martin.....	1915		
Karras, Myron A.....	1920	MISSISSIPPI.	
Maudigo, Wm. R.....	1922	<i>Arcola.</i>	
McColl, Henry.....	1910	Lee, Luther Quincy.....	1920
Messing, Richard J.....	1913	<i>Artesia.</i>	
Muggenburg, Arthur A.....	1922	Cox, Alvin Conley.....	1921
Noyes, Charles Reinold, B.A....	1908		
Podvolicke, Ralph H.....	1922		
Rietzke, Herman W.....	1909		

MISSISSIPPI—MISSOURI.

<i>Corinth.</i>		<i>Vicksburg.</i>	
Wilson, Charles E.....	1921	Heckler, Michael Schuster.....	1918
<i>Flora.</i>		Rayner, Walter Holmes.....	1922
Anding, C. E.....	1914	<i>Yazoo City.</i>	
<i>Fondren.</i>		Ellis, J. B.....	1922
Pettis, William Eugene.....	1922	Stigler, Adele.....	1920
<i>Grenada.</i>		MISSOURI.	
Brooks, Selma Louise.....	1920	<i>Boonville.</i>	
<i>Hattiesburg.</i>		Mittelbach, William, Ph.G.....	1891
Jones, James E.....	1922	<i>Brunswick.</i>	
<i>Haslehurst.</i>		Bowen, Cyrus West, B.S., M.S.,	
Featherston, Lucius Horace, Jr..	1920	M.D., Ph.G.....	1912
<i>Jackson.</i>		<i>Cape Girardeau.</i>	
Culver, John W.....	1922	Miller, Edwin Alexander, B.Pd.,	
Hall, Edward J.....	1918	Ph.G.....	1912
Key, S. B.....	1922	Miller, Isaiah Benjamin.....	1912
Waits, Chas. Forrest.....	1922	<i>East Prairie.</i>	
Ward, M. E.....	1922	Doyle, Robert A.....	1914
<i>Laurel.</i>		<i>Excelsior Springs.</i>	
Wallace, Lew.....	1920	Tindall, Henry Clay.....	1918
<i>McComb.</i>		<i>Farmington.</i>	
Beard, John A.....	1918	Fuhrmeister, Fred W.....	1920
<i>Meridian.</i>		<i>Hannibal.</i>	
Kendall, Gus C.....	1913	Davis, John T., Jr.....	1918
<i>Mize.</i>		<i>Hornersville.</i>	
McMullan, Malcolm Hillard....	1920	Bryant, John Wilson.....	1920
<i>Pass Christian.</i>		<i>Hunnewell.</i>	
Hanson, Guy.....	1921	O'Daniel, William Francis.....	1921
<i>Port Gibson.</i>		<i>Kansas City.</i>	
SHREVE, JOHN ALEXANDER.....	1880	Amos, Wilber Stanton.....	1908
<i>Rosedale.</i>		Clarke, Bruce Edwin.....	1920
Henshaw, Wrennie Carroll.....	1920	Faxon, Henry D.....	1920
<i>Tchula.</i>		Federmann, William Martin....	1901
Herbert, W. C.....	1922	Fuller, James Cook.....	1918
<i>Tupelo.</i>		Hess, Paul Ludwig.....	1892
Thomas, Perry K.....	1922	Linck, Truman A.....	1916
<i>Union.</i>		Whitney, David Victory, Ph G..	1903
Carleton, Eugene Elias.....	1921	Whitney, Minnie M. (Mrs.)....	1914
<i>University.</i>		Wilson, Nathan Warren.....	1920
Faser, Henry Minor.....	1910	Wirthman, John George.....	1903
Moser, Clio Silverlain.....	1920	Wirthman, Joseph Charles.....	1903

MISSOURI.

<i>Malden.</i>		Jones, Harold W.....	1913
Metzger, Arthur S., Ph.G., Ph.C.....	1908	Kapsidas, Christ T.....	1920
<i>Marshall.</i>		Koch, Albert H.....	1914
Davis, John T., Jr.....	1916	Koeneke, Charles Henry.....	1920
Llewellyn, Henry Duncan.....	1915	Kautsoumpas, William.....	1922
<i>Nevada.</i>		Kring, Gustave.....	1912
Ballagh, Wilfred Thomas.....	1901	Kurtz, Irwin William.....	1904
<i>New Madrid.</i>		Lambert, Alert Bond.....	1914
Hummel, John Andrew.....	1901	Lanwermyer, Charles F.....	1920
<i>St. Joseph.</i>		Lehmann, Louis John.....	1911
Rudolph, Bertha (Mrs.).....	1919	Lieberstein, Jacob.....	1913
<i>St. Louis.</i>		Lieberstein, Louis, Ph.G.....	1909
Allard, Herman Joseph.....	1914	MALLINCKRODT, EDWARD.....	1869
Ambler, Jessie H.....	1914	Margerum, Donald Cameron....	1918
Barnstead, Sidney Ormon.....	1917	McCartney, Frank Leslie, Phar.D.....	1907
Bebie, Jules.....	1920	McGowan, William Chester....	1920
Blakeslee, Louis George.....	1903	Merrell, George Robert.....	1901
Block, Harry L.....	1920	Merrell, Hubert Spencer, Jr., Ph.B., Ph.C.....	1910
BOEHM, SOLOMON.....	1871	Meyer, Carl F. G.....	1918
Brewer, Justin Sewall.....	1912	Meyer, Otto Paul.....	1920
Buckland, Thomas A.....	1914	Noble, J. Merner.....	1917
Burkart, Glen A.....	1915	Noll, Martin J.....	1920
Byrnes, George Raymond.....	1920	Pauley, Alfred Washington.....	1914
Caspari, Charles Edward.....	1902	PAULEY, FRANK CHARLES.....	1879
Claus, Otto Ferdinand, M.D....	1901	Prichard, Leslie Elridge.....	1918
Coussens, Bettie Prince (Miss)..	1910	Quade, William H.....	1920
Craig, Edgar Eugene.....	1920	Robertson, Louis A.....	1920
Dietel, Herman.....	1920	Roelichen, Harry.....	1920
DuBois, Gaston.....	1921	Ruddiman, Edsel Alexander, Ph.C., Ph.D., M.D.....	1894
Duggan, Charles Gore.....	1920	Ruf, Frank A.....	1913
Essig, Carl F.....	1920	Schlichting, Arthur Floyd.....	1913
Falk, John Charles, Ph.G., M.D.	1900	Schlueter, Robert Ernst, Ph.G., M.D.....	1904
Faber, Nathan Morris.....	1922	Schoenthaler, John Paul.....	1901
Farr, Harry Valentine.....	1920	Seitz, Lorenz Aloysius.....	1901
Florian, Alvin Geo.....	1918	Sennewald, Emil August.....	1900
Fricke, Frederick Henry.....	1901	Speckart, Otto Norbert.....	1914
Gasen, Abraham Lincoln.....	1921	Sternfels, Urvan Ruiz.....	1918
Gietner, Charles, Ph.G.....	1905	St. John, Burton Harold.....	1920
Grewe, Louis Frederick, Ph.G....	1901	Stolle, Henry Jasper.....	1903
Hahn, Charles Wm. John Henry	1901	Stuart, Francis Joseph.....	1913
Hammett, Frank U.....	1914	Sultan, Frederick William.....	1901
Harnist, Milton J.....	1921	Suppan, Leo Richard August....	1904
HEMM, FRANCIS.....	1881	Swift, Fred H.....	1920
Hoenny, Adolph J.....	1920	Thomas, John H.....	1920
Ilhardt, William Kelerman.....	1901		

MISSOURI—MONTANA—NEBRASKA.

UHLRICH, FERDINAND GOTTLIEB.....	1881	Deer Lodge.	
Vogler, Herman A.....	1920	Mueller, Franklin C.....	1921
WALL, OTTO AUGUSTUS.....	1884	Ennis.	
Webb, Raymond S.....	1920	Folkestad, Charles W.....	1921
Welsh, Joseph Bruner.....	1910	Great Falls.	
WHELPLEY, HENRY MILTON, PH.G., M.D.....	1887	Lapeyre, Ben. E., Jr.....	1916
Widmer, Joseph Martin.....	1920	Woehner, Frederick A.....	1909
Wilkerson, Jerome Aloysius.....	1911	Helena.	
Williams, N. Emery, Ph.G.....	1912	Ritter, Walter A.....	1918
Wolff, Edward-Henry.....	1901	Starz, Emil.....	1916
Wyllie, John Hardie.....	1920	Lewistown.	
Sedalia.		Seiden, John W.....	1920
Bard, William E.....	1901	Livingston.	
SMITH, OTIS WILMER.....	1903	Calhoun, William Baron.....	1921
Springfield.		Scheuber, Frank Augustus.....	1905
Trantham, Isham A.....	1914	Malta.	
Webster Grove, St. Louis Co.		Murray, J. F.....	1920
Garvin, William S.....	1917	Miles City.	
MUELLER, AMBROSE.....	1894	Foster, George K.....	1920
Weston.		Schiesser, Elizabeth Marion.....	1920
Simmons, Thomas Egbert.....	1922	Missoula.	
Windsor, Henry Co.		Bateman, Herbert Howard.....	1919
Wesner, Henry Clay.....	1901	Coffee, Sidney J.....	1909
MONTANA.		Mollett, Charles Edwin Francis, Ph.C.....	1909
Anaconda.		Peterson, A. Francis.....	1922
Fuller, Clarence R.....	1920	Peterson, Alex F.....	1914
Gnose, Olive C.....	1920	Rakeman, Henry.....	1922
Belgrade.		Pablo.	
Porter, W. P.....	1915	Olson, Silas C.....	1921
Billings.		Valier.	
Erb, Olin.....	1917	Starbuck, James Nathan.....	1920
Boseman.		Winnett.	
Kraker, John Lewis.....	1912	Woods, Robert J.....	1920
Broadus.		NEBRASKA.	
Holt, Stephen A.....	1921	Arlington.	
Butte.		Weber, Don Caesar.....	1908
Harshfield, S. M.....	1921	Atkinson.	
Montgomery, W. R.....	1915	Schultz, William Ludwig.....	1915
Moore, Cecil J.....	1922	Auburn.	
Conrad.		Dort, Edward Harvey.....	1903
Heden, Myrtle M.....	1918		

NEBRASKA—NEVADA—NEW HAMPSHIRE—NEW JERSEY.

<i>Edgar.</i>		<i>York.</i>	
Brookley, Will.....	1915	Hildebrand, Charles Pinkney....	1922
<i>Fairbury.</i>		NEVADA.	
Pease, Autumn Vine.....	1893	<i>Elko.</i>	
<i>Holdredge.</i>		Englert, William Robert.....	1915
Fink, Daniel Jacob.....	1903	<i>Tonopah.</i>	
<i>Kenesaw.</i>		Piercy, Joseph C.....	1918
Mikkelsen, Niels.....	1903	NEW HAMPSHIRE.	
<i>Lexington.</i>		<i>Groveton.</i>	
Naviaux, Ernest Louis.....	1918	Elliott, Fay Harold.....	1916
<i>Lincoln.</i>		<i>Manchester.</i>	
Butler, Guy.....	1909	Knowlton, George Harry.....	1907
Fruide, Glen O.....	1921	<i>Portsmouth.</i>	
Gray, Ralph Egbert.....	1921	Grace, William Day.....	1896
Haschenburger, Edmund Ommen,		Green, Benjamin.....	1888
Ph.G.....	1907	Norton, William M.....	1920
Kunzmann, C. William.....	1921	<i>Somersworth.</i>	
Lyman, Rufus Ashley, A.B.,		Des Marais, Napoleon Alphonse.	1921
A.M., M.D.....	1908	NEW JERSEY.	
Schneider, Albert, B.S., M.S.,		<i>Atlantic City.</i>	
M.D., Ph.D.....	1899	Crawford, Dean Burton.....	1916
Wilson, Smith C.....	1921	Plum, William Marlette.....	1920
<i>McCook.</i>		Schofield, Edith M.....	1921
McConnell, Lewis William, Ph.G.	1904	Sherr, Orrin.....	1920
<i>Omaha.</i>		Venner, Frank A.....	1921
Cermak, Emil.....	1908	<i>Bayonne.</i>	
Danielson, Ryle Waldermar....	1921	Bauer, Mabel Anna.....	1922
Fitz-Simon, Vincent Joseph....	1907	Dodge, Francis Despard.....	1910
Gerald, Herbert Franklin, M.D..	1908	Reiser, Philip.....	1913
GERING, HENRY R.....	1906	Turner, Joseph L.....	1914
Gilland, Charles E.....	1921	<i>Bloomfield.</i>	
Green, James Harvey.....	1912	Goldberg, Abraham I.....	1921
Myers, Preston B.....	1921	<i>Bound Brook.</i>	
Newton, Howard Chamberlain ..	1912	Cardarelli, Eugene James.....	1916
Piel, Warner A.....	1912	<i>Bridgeton.</i>	
Sherman, Charles Rollin.....	1889	Jorden, Henry Albert, Ph.G.....	1902
<i>Plattsmouth.</i>		Whipple, Oscar Kellog.....	1916
Fricke, Frederick George.....	1903	<i>Burlington.</i>	
Mauzy, James G.....	1915	Sparks, Edgar Reed, Ph.G.....	1909
<i>Stuart.</i>		Sparks, Ruth Everest.....	1921
Coats, Mabel Leota.....	1920		
<i>Wood River.</i>			
Hoye, Daniel J.....	1911		

NEW JERSEY.

Camden.

Beringer, George Mahlon.....	1893
Beringer, George Mahlon, Jr., P.D.....	1905
Glebe, William Moss.....	1920
Herting, A. C.....	1918
Pitt, Charles.....	1921
Randolph, John R.....	1919
Reiss, Leon.....	1920

Clifton.

Takamine, Jokichi.....	1898
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Collingswood.

Sturmer, Julius William, Ph.G., Phar.D.....	1901
Vanderkleed, Charles Edwin....	1902

Cranford.

Goeckel, Henry Jos.....	1918
Zingales, Gaetano.....	1920

Dover.

Meuser, Louis J.....	1916
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East Orange.

Dahl, Fred.....	1913
Denny, Henry W.....	1922
Geisler, Leo Waldemar.....	1910
Henry, Robert, M.D.....	1922
Wickham, Edward A.....	1919

Elizabeth.

Frohwein, Walter M.....	1920
Jacobson, Samuel M.....	1915
Langheinz, Louis P.....	1915
OLIVER, WILLIAM MURRAY.....	1875
Prebol, Bronislaw.....	1920
Reibel, Charles A.....	1922
Schmidt, Henry.....	1904
Todd, Louren Evans.....	1922
Zehner, Guy Oram.....	1918

Frenchtown.

Harman, Harry M., M.D.....	1909
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Gibbstown.

Ullrich, Otto.....	1920
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Hackensack.

Steiger, Leonard.....	1918
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Haddonfield.

King, James David.....	1910
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Hillside.

Nielson, Paul Edward.....	1919
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Hoboken.

Schmidt, Adolph.....	1920
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Irvington.

Scholz, Frank H.....	1921
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Jersey City.

Florenzie, Oscar Howard.....	1920
FOULKE, JAMES.....	1881
Gold, Arthur.....	1920
Hommell, Philemon E.....	1922
Kohl, Abraham.....	1921
McCloskey, Charles J.....	1919
Owens, William H.....	1916
Patella, Carmela.....	1918
Renzulli, Aurelio V.....	1920
Richardson, Gerald Arthur.....	1918
Uhorchak, Michael.....	1920
Vena, John J.....	1921

Kearney.

Shaak, Franklin Philip.....	1906
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Keyport.

Hopkins, Henry T.....	1921
Warn, William Edgar.....	1886

Lakewood.

Taylor, Leon A.....	1916
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Linden.

Kraemer, William Charles.....	1914
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Long Beach.

Potter, James, S.....	1916
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Maplewood.

Geimer, Frederick M.....	1916
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Maywood.

Balmert, Clemens A., Phar.D....	1909
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Medford.

THORN, HENRY PRICKETT, Ph.G.	1879
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Middletown.

Spiers, Douglas R.....	1921
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NEW JERSEY.

Montclair.

Gesell, William H.....	1919
Stein, Edward Theodore North..	1916
Wensch, Henry Ernst, Jr., Ph.G.	1902

Morristown.

CARRELL, EUGENE AYERS.....	1875
Smith, Henry M.....	1918

Mount Holly.

Jones, Edward B.....	1909
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Newark.

Bear, Pierce B.....	1905
Crooks, Harry W.....	1915
Disbrow, William Stephen, M.D.	1915
Essbach, Gustave John.....	1921
Foster, John Benjamin.....	1901
Greenwood, Joseph Hermann....	1920
Haase, William Frederick, Jr....	1918
Holzhauser, Charles William....	1907
Knecht, Paul F.....	1920
Koelbel, Carl Robert.....	1919
Maltbie, Birdsey Lucius.....	1912
Marquier, Adolph F., Ph.G.....	1909
Menk, Charles William.....	1898
Quin, Harry J.....	1918
Ritchie, Margaret (Miss).....	1919
Rusby, Henry Hurd.....	1890
SAYRE, EDWARD AUGUSTUS.....	1877
Scholz, Oscar Robert Bruno....	1909
Seidler, Alexander.....	1916
Sherwin, Robert S.....	1922
Staehle, Louis L.....	1916
Tuffiash, Charles.....	1920

New Brunswick.

Anderson, John.....	1918
KILMER, FREDERICK BARNETT..	1886
Lebolt, Sidney J.....	1922

New Vernon.

Byrnes, Garrett.....	1913
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Ocean Grove.

Woolley, Stephen Disbrow....	1915
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Orange.

Grossman, Morris.....	1921
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Paterson.

Cohen, Gerschen.....	1921
Dewis, William J.....	1920
Jaffe, William M.....	1920
Lamar, Wm. Robinson.....	1901
Mutter, Wm.....	1920
McNeil, Robert.....	1907
McNeil, William Henry.....	1912

Penn's Grove.

Johnson, Charles Emerson.....	1920
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Perth Amboy.

Hawryliw, Paul.....	1920
Parisen, George Warren.....	1892

Plainfield.

Tocco, Orazio.....	1910
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Point Pleasant.

Johnson, Albert Burtis.....	1916
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Rahway.

Millman, Harold Fildew.....	1920
Murray, Benjamin Linley, Ph.C., B.S., A.M.....	1896
Verneau, Edward J.....	1916

Ramsey.

Hubbard, Winfield Scott, Ph.G., B.S., M.A., Ph.D.....	1912
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Ridgefield Park.

Neu, Daniel Alfred.....	1903
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Rutherford.

Makholm, Jeppe C. M.....	1920
Stocking, Charles Howard.....	1914

Spring Lake Beach.

Frock, Lisle Price.....	1922
Hills, Daniel Henry.....	1918
Johnson, Gustav Adolph.....	1920

Summit.

Rothberg, Pincus.....	1921
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Tenafly.

Bower, Edwin Lawrence.....	1909
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Trenton.

Keuper, Joseph Thomas.....	1920
Leigh, Francis B.....	1921

NEW JERSEY—NEW MEXICO—NEW YORK.

Union Hill.

Bischoff, H. E.....	1915
Hermann, Charles.....	1919

Vineland.

Lowe, Clement Belton, Ph.B., Ph.G., M.D.....	1895
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Weehawken.

Frank, August, Ph.G.....	1912
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West Hoboken.

Eckert, Frank H.....	1921
Maggio, James Innocenzo.....	1907
Suhr, Louise Seline.....	1916

Westfield.

Frutchey, George Watson.....	1909
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Westmont.

Rose, William Wilson.....	1918
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West New York.

Clarke, Hugh.....	1921
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West Orange.

Mead, Harold Barr.....	1910
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Woodstown.

Andrews, George M.....	1913
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NEW MEXICO.

Albuquerque.

Ruppe, Bernard Charles.....	1908
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Las Cruces.

Dyne, Bert George.....	1915
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Raton.

Weitgenant, Wayne W.....	1921
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NEW YORK.

Albany.

BRADT, WARREN LANSING.....	1903
Lange, Wm. Maurice.....	1914
MICHAELIS, GUSTAVUS, Ph.G....	1882
Ostrander, Clarence Edward....	1916

Antwerp.

Rogers, George L.....	1920
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Auburn.

Adams, Arthur Ellison.....	1902
Sears, Charles Barager.....	1906

Bound Brook.

Cardarelli, Eugene James.....	1916
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Bronx.

Feller, Leo.....	1916
Frank, Henry.....	1918
Hager, Max M.....	1918
Petretti, Oreste.....	1918
Weinstock, Sidney.....	1918
Zagat, Mendel.....	1918

Brooklyn.

Anderson, William Christine, Ph.G., Phar.D.....	1900
Arnold, Henry C. F.....	1918
Austin, Frederick James.....	1920
Bartlett, Kenneth A.....	1919
Berg, Frantz F., Ph.G.....	1914
Bloom, Paul D.....	1921
Brownelle, Howard F.....	1920
Chasaw, Nathaniel Morton.....	1920
Cheatham, Wm. B.....	1917
Cook, Harry Warren.....	1919
Creagan, William Thomas.....	1912
Cupo, Phillip G.....	1920
Davis, Charles T.....	1920
DeJonge, Cornelius.....	1899
Dewender, William Henry.....	1896
Diehl, August.....	1909
Dissosway, Thurston N., Ph.C....	1905
Dougherty, Albert James.....	1921
Downer, William J.....	1920
Duerr, George John.....	1911
Eccles, Robert Gibson, M.D....	1885
Fischer, Charles F.....	1919
FOUGERA, EDMUND CHARLES HENRY.....	1890
France, Thos. J.....	1917
Fried, Harry.....	1920
Friedhoff, Ernest.....	1920
Giorgianni, Salvatore.....	1918
Guerra, Alirio Diaz, M.D.....	1916
Heimezheim, Eugene.....	1914
Jackson, William R.....	1918
Kaminsky, Harry.....	1920
Kissick, Robert George.....	1917
Kitzis, Max.....	1921
Krancer, David.....	1919
Krumwiede, Howard Andrew....	1919

NEW YORK.

Levine, David.....	1921
Lohness, Archie Percival.....	1913
Mangan, Daniel C.....	1918
Marinoff, Jacob.....	1915
McELHENIE, THOMAS DEAR-	
MOND, PH.G.....	1872
Means, Earl A.....	1918
Miller, Reginald.....	1921
Neninger, Fred Martin.....	1915
Nitardy, Ferdinand Wilhelm,	
Ph.G., Ph.C.....	1905
Planton, H. Rolff.....	1916
Raubenheimer, Otto, Ph.G.....	1902
Rehfuss, Jacob H.....	1913
Ritch, Allan L.....	1920
Rosenzweig, Benjamin.....	1898
Rottenberg, Morris L.....	1922
Santi, Ruisi.....	1920
Saperstein, Abraham.....	1921
Schaefer, Frederick.....	1916
Schoetzow, Ray E.....	1920
Schwartz, Israel.....	1914
Smith, Henry B.....	1920
Smith, Henry Lees.....	1920
Snyder, Ambrose Chancellor.....	1867
Sundock, Philip.....	1920
Tuthill, Frederick Percival,	
Ph.G., Phar.D.....	1899
Westheimer, David.....	1912
Weygandt, Wm. H.....	1918
White, Joseph Leyden.....	1909
Wyckoff, Elmer Ellsworth.....	1906
<i>Buffalo.</i>	
Bentz, Florence Louise.....	1917
Bentz, Henry George.....	1904
Booth, Clarence Frederick.....	1916
Dimond, Harry John.....	1904
Dunghi, Mario Louis.....	1921
Fish, Erwin L.....	1918
Gregory, Willis George, M.D.,	
Ph.G.....	1886
Handy, John Abner.....	1914
HAYES, HORACE PHILLIPS.....	1880
Koch, Edward Wm.....	1918
Lockie, Peter M.....	1911
Morgan, Richard Franklin.....	1914
Reimann, George.....	1902
Starr, Mabel Charlotte.....	1916

Cairo.

Austin, Richard A.....	1916
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Cambridge.

Richardson, Frank, Ph.G.....	1906
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Catskill.

DUBOIS, WILLIAM LANEMAN.....	1880
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Chatham.

Alvord, Harry E.....	1919
Hoffman, Geo. Niles.....	1902

City Island.

Gilbert, Otto Philipp.....	1920
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College Point.

Klein, Edward Nicholas Emil,	
Ph.C.....	1905

Corning.

COLE, VICTOR LEROY.....	1880
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Corona, L. I.

Doctors, Alexander.....	1921
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Dannemora.

Sloss, Robert Audley.....	1901
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Dansville.

Stearns, William Lincoln, Ph.G..	1903
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Delmar.

Mansfield, Wm.....	1907
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Dunkirk.

Davis, Eugene Miller.....	1892
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Ellis Island.

Rogers, Edward.....	1902
Scott, Edgar Burroughs.....	1905

Elmhurst, L. I.

Goodman, Joseph.....	1916
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Elmira.

Atwater, Herbert D.....	1920
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Flushing.

Fay, William E.....	1920
HEPBURN, JOHN.....	1873

Hudson.

Wardle, Arthur Stanley.....	1910
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Jamaica, L. I.

Kassner, Herbert Carl.....	1921
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NEW YORK.

Kingston.

Dedrick, William Frederick..... 1914
McBride, Charles Luther..... 1910

Little Falls.

Hurley, John..... 1909

Long Island.

Dunn, Mrs. John^{*} A..... 1919
Hearn, Joseph Cecil..... 1921
Hereth, Franklin Samuel..... 1893
Lane, Florence Carolyn..... 1921
MICHAELS, GEORGE L..... 1917
Morgan, William F., Phar.D.... 1917
Waring, Olaf I..... 1921
Yeomans, Sidney C..... 1920

Middletown.

Rogers, Fred Schwartz..... 1914
ROGERS, WILLIAM HENRY..... 1869

Mount Vernon.

Horstman, Gustave, Ph.D..... 1914
Swallow, Edward..... 1922

New Lebanon.

Cox, J. Harry..... 1914

New York.

Allison, William O..... 1895
Altman, Jos..... 1914
Aquaro, Joseph..... 1920
ARNY, HARRY V., Ph.G., Ph.D.. 1891
Baden, Frederick, Jr..... 1920
Ballard, Charles William, Ph.C.,
Phar.D., M.A..... 1908
Baltzy, Elizabeth..... 1920
Bankoff, Jacob..... 1915
Beilstein, Christian..... 1907
Berger, Louis, Ph.G..... 1907
Bernstein, Chanon..... 1916
Bigelow, Clarence Otis..... 1900
Bilhuber, Ernst..... 1912
Black, Franklin..... 1916
Blomeier, Herman Henry..... 1915
Blumenkrantz, Isidore Jacob.... 1916
Bonisteel, Wm. J..... 1921
Bote, Lester Elmer..... 1916
Brandt, Max..... 1920
Breivogel, Philip J..... 1916
Brickelmaier, Paul H..... 1913

Brisson, Alfred Frederick..... 1917
Brown, Lewis Nathan..... 1916
Buch, Henry..... 1920
Budelman, Fred J..... 1920
Bush, Burton T..... 1916
Caan, James H..... 1920
Caleagno, Vit..... 1920
Canis, Otto F. A..... 1918
Cantor, Charles I..... 1920
Caracciolo, Egidio..... 1920
Carlander, Oswald Rudolph.... 1921
CHANDLER, CHARLES FREDERICK 1867
Chapman, Chas. J..... 1918
COBLENTZ, VIRGIL..... 1882
Commons, Gordon L..... 1921
Commons, Vivian K..... 1921
Cone, Alfred I..... 1905
Cooperman, Samuel..... 1920
Costelo, David..... 1915
Currens, Turner Fee..... 1914
Daggett, Volvey Chapin..... 1901
Dean, Corliss Page..... 1917
Decker, George..... 1920
Diamond, Peter..... 1920
Diekman, Clara Ada (Mrs.).... 1912
Diekman, George Charles..... 1898
Dill, Charles Thomas..... 1917
Dilleuth, Frederick G., M.D.. 1916
Dimiceli, Morris..... 1921
Diner, Jacob, Ph.G..... 1906
Dorb, Abraham..... 1920
Dreyer, John D..... 1917
Dusenberry, Elias W..... 1920
Eddy, Clyde L..... 1916
Erhart, William Hermann..... 1907
FAIRCHILD, BENJAMIN THOMAS 1875
Fairchild, Samuel William..... 1887
Fairchild, Tappen..... 1920
Feldman, Jacob..... 1917
Fentress, James H..... 1920
Fischelis, Robert Philip, Ph.G.,
Ph.C., B.Sc..... 1911
Fitzsimmons, Geo. E..... 1917
Foster, Paul L..... 1920
FRASER, HORATIO NELSON.....
Ph.G., Ph.M., M.D..... 1888
Friedgen, Charles..... 1915
Galpin, Harry Tower..... 1920

NEW YORK.

Gane, Eustace Harold.....	1895	Krack, John.....	1920
Geisler, Joseph Frank.....	1889	Kramer, Bela.....	1920
Gerstner, Robert R.....	1920	Lampa, Robert Raymond.....	1892
Ginliani, Anthony.....	1918	Lascoff, Jacob Leon.....	1903
Goff, Walter S.....	1920	Lascoff, Joseph D.....	1920
Golding, George Henry.....	1920	Leger, Edmond Joseph.....	1921
Goldwag, Joseph Samuel.....	1918	Lehman, Robert Seel.....	1917
Greenberg, Joseph.....	1918	Leslie, Frederick Arthur.....	1916
Greenberg, Meyer.....	1920	Leventhal, Reuben.....	1921
Grossman, David.....	1920	Levy, Louis Spencer.....	1911
Gullo, Salvatore Joseph.....	1920	Litvin, Augusta.....	1916
Haines, Herbert E.....	1920	LoPorto, Edward E.....	1916
Hamann, William Augustus.....	1907	Lovis, Henry Christian.....	1892
Hammer, Harry Julius.....	1921	Luft, George W.....	1913
Hansburg, Max.....	1916	Lund, Charles.....	1920
Harris, Harry L.....	1913	Lurei, James.....	1914
Harris, Isaac F.....	1920	MacAdams, Harold.....	1920
Hart, Fanchon.....	1917	Mace, John Edward.....	1916
Hatcher, Robert Anthony.....	1905	Macsata, William J.....	1921
HAYNES, DAVID OLIPHANT.....	1887	Maer, Peter.....	1920
Haynes, Nathan William.....	1920	Major, Alphonse.....	1913
Henning, Adolph.....	1905	Malis, Isidore.....	1920
Herenberg, Curt.....	1920	Mantell, David R.....	1919
Herzog, Carl J.....	1918	Margulis, Abraham.....	1925
Hessler, Elmer H.....	1914	Mayer, Joseph L.....	1905
Hohmann, George.....	1910	Mazeloff, Aaron.....	1921
Holcomb, Willis Cobb.....	1918	McINTYRE, EWEN, JR.....	1903
Holliday, Francis Emlen.....	1900	McKesson, Donald, B.A.....	1906
Hopkins, Jesse L.....	1898	McKesson, George Clinton.....	1888
Hostmann, Jeannot.....	1912	McKESSON, JOHN, JR.....	1867
Ippolito, Frank Alfred.....	1922	McQuade, Jerry.....	1921
Israel, Boris S.....	1918	Metz, Herman A.....	1910
Israel, David.....	1918	Meyer, Samuel.....	1921
Jacobsohn, Joseph.....	1915	Miskimon, Robert Roy.....	1921
Jones, James H.....	1915	Nevin, Thomas.....	1912
Kalish, Oscar G., Ph.G.....	1900	Nicolai, Nathaniel.....	1920
Kantrowitz, Hugo.....	1907	Noonan, Harry.....	1916
Keim, Raoul D.....	1916	Oats, Charles A.....	1917
KENNEDY, EZRA JOSEPH.....	1887	O'Kane, Eugene Tracy.....	1918
Ketcham, Sylvivius.....	1918	Parker, Frank.....	1918
Kirk, Wm. Charles, Ph.G.....	1886	Parsons, Charles West.....	1920
Kleppner, Vilma.....	1919	Partos, N. C.....	1916
Klingmann, Albert.....	1910	Pase, Homer S.....	1916
Koch, William Julius.....	1907	Pegg, George W.....	1918
Kochler, Albert.....	1920	Penick, S. Barksdale.....	1914
Kollen, Daniel M.....	1920	Peppmuller, Ernest A.....	1920
Konnerth, Rudolph Alexander...	1921	Pfeiffer, Gustavus Adolphus...	1910
Kopald, Sigmund.....	1920	Pierson, Romaine.....	1913

NEW YORK.

Plaut, Edward.....	1916
Pobe, C. Emil.....	1922
Podolsky, Reuben.....	1915
Pontecorvo, Louis.....	1922
Potts, Thomas Humphreys.....	1906
Pursell, Robert C.....	1916
Putt, Earl B.....	1914
Quackenbush, Benjamin Franklin	1886
Rabinowitz, Wm. Joseph.....	1915
Reasko, Herman.....	1920
Renwick, William.....	1920
Richards, Albert.....	1921
Riefflin, George T.....	1909
Rippetoe, John Ross, P.D.....	1907
Roediger, Louis Frank, Ph.G....	1909
Roediger, T. Frederick.....	1921
Roller, Emil, Ph.G.....	1916
Romanoff, Isidor Louis.....	1921
Roon, Leo.....	1913
RUNYON, EDWARD WHEELOCK...	1875
Russin, Uriel.....	1920
Sahn, Louis Napoleon.....	1905
Schaefer, Hugo.....	1916
Schieffelin, William Jay, M.D....	1892
Schmeier, Alexander.....	1921
Schmidt, Frederic Kuhn.....	1921
Schnell, Harry Julius.....	1906
Schweinfurth, George Edward...	1907
Scott, Harry.....	1907
Sencindiver, Judson.....	1918
Sharkansky, Eugene Louis.....	1918
Shattuck, H. B.....	1918
Sheinfine, Louis.....	1921
Sher, Edward.....	1911
Shigon, Henry.....	1921
Shnitter, Adolf, Ph.G.....	1914
Silkes, Charles.....	1918
Smith, Wm. I.....	1921
Solomon, Abraham.....	1918
Sparhawk, Charles V.....	1916
Spring, George Alexander.....	1907
Starr, Frank C.....	1917
Stauffen, Ernst.....	1916
Steinach, Edwin C.....	1919
Sterling, Montaigu M.....	1918
Stevenson, Ralph M.....	1921
Taub, Harry.....	1921
Timmermann, Richard Hermann.	1909

Tischelman, Nathan.....	1921
Tomashoff, Harris A.....	1920
Tompkins, George R.....	1916
Tucker, Thomas H.....	1912
Ungerer, Wm. Geo.....	1918
Van Buren, Charles H.....	1920
Velsor, Joseph A.....	1913
Villamena, Diadato.....	1918
Villamena, Ermilinda M.....	1920
Walter, Herman.....	1916
Wasserchied, August A.....	1916
Weicker, Herman G.....	1920
Weiss, Emil Otto.....	1907
WICKHAM, WILLIAM HULL.....	1870
Willer, Max.....	1920
Wimmer, Curt Paul.....	1907
Witt, Abram R.....	1920
Yates, Franklin B.....	1916
Zink, Edward.....	1916
Zufall, C. J.....	1919
Zwilling, Harry.....	1920

Norwich.

Beach, DeMott Clark.....	1915
Eaton, Melvin Carr.....	1916
McNulty, William Peter.....	1916
Snyder, John Paul.....	1915
Windolph, J. Fred.....	1913

Oyster Bay.

Shepherd, James Edgar.....	1920
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Plattsburg.

Senecal, Henry C.....	1911
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Richmond Hill, L. I.

Garvey, James A.....	1909
Milana, Benjamin L.....	1921
Stephenson, John Joseph, Ph.G..	1905

Portchester.

O'Hagan, Chas, F.....	1921
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Rochester.

Samson, Meyer.....	1921
Smith, J. Hungerford.....	1913

Rockaway Park.

Mark, Benno H.....	1920
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Rye.

Lipowsky, Isador.....	1921
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NEW YORK—NORTH CAROLINA.

<i>Salamanca.</i>	
Krieger, John Christian.....	1908
<i>Sangertiss.</i>	
Sticht, Gustave Alfred.....	1916
<i>Saratoga Springs.</i>	
Cramer, Louis H.....	1914
FISH, CHARLES FREDERICK.....	1866
<i>Sayville.</i>	
Thornhill, Sewell.....	1909
<i>Scarsdale.</i>	
O'Farrell, L. P.....	1921
<i>Springfield, L. I.</i>	
De Forest, William Pendleton....	1879
<i>Syracuse.</i>	
DAWSON, EDWARD SEYMOUR, JR..	1876
Muench, Albert August.....	1914
SNOW, CHARLES WESLEY.....	1876
Wright, Herbert G.....	1922
<i>Tottenville.</i>	
Lehman, Charles Norton.....	1909
<i>Utica.</i>	
Paolantonio, John.....	1918
Watson, William, Jr.....	1902
<i>Welfare Island.</i>	
Glassgold, Louis R.....	1922
<i>Westbury, L. I.</i>	
Bartley, S. Marvin.....	1920
<i>White Plains.</i>	
Davis, Mrs. May Agnes.....	1917
Loud, Theodore Richard L.....	1917
Quarfordt, Jarkof Albin.....	1922
<i>Woodhaven, L. I.</i>	
Canis, Otto P. M.....	1921
Degele, Carl S.....	1921
Zeluff, Irwin Simpson.....	1915
<i>Yonkers.</i>	
Klatz, Boruch.....	1918
Petsche, Franz Friedrich Bis-	
marck Wilhelm.....	1892
Schlesinger, Leopold Joseph....	1912

NORTH CAROLINA.

<i>Asheville.</i>	
Goode, John Alonzo.....	1920
<i>Bryson City.</i>	
Bennett, Kelly Edwin.....	1913
<i>Burlington.</i>	
Henderson, John Leland.....	1920
<i>Chapel Hill.</i>	
Beard, John G.....	1918
Howell, Edward Vernon.....	1900
<i>Charlotte.</i>	
Stowe, James Pinkey.....	1914
<i>China Grove.</i>	
Swaringen, DeWitt Clinton.....	1905
<i>Dunn.</i>	
Graham, George Kenneth.....	1920
<i>Edenton.</i>	
Sutton, James Linwood.....	1916
<i>Fayetteville.</i>	
Horne, Warren Winslow, Ph.C...	1902
<i>Greensboro.</i>	
McDuffie, Roger A.....	1921
Wilson, Eugene C.....	1919
<i>Greenville.</i>	
Brown, Joseph Key.....	1920
<i>High Point.</i>	
Matton, Geo. A.....	1916
<i>Kinston.</i>	
Isler, William Arthur.....	1921
<i>Linden.</i>	
McArtan, Alexander Bell.....	1920
<i>Monroe.</i>	
Blair, Stephen Oscar.....	1920
<i>Morgantown.</i>	
Greyer, Charles Peyton.....	1912
<i>Mount Airy.</i>	
Hollingsworth, Joseph.....	1920
<i>Pittsboro.</i>	
Pilkington, George R.....	1916

NORTH CAROLINA—NORTH DAKOTA.

Raleigh.

Hicks, Henry T. 1916

Rocky Mountain.

Briles, David Thomas. 1916

Dailey, J. F. 1921

Rose, Ira Winfield, Ph.G. 1912

Tarboro.

ZOELLER, EDWARD VICTOR. 1878

Tryon.

Missildine, Ernest Ellwood, A.B. 1910

Wilmington.

Gahn, Henry. 1902

HARDIN, JOHN HAPWOOD. 1881

Ledbetter, Edmond DeBerry. 1921

Winston-Salem.

Welfare, Sam E. 1916

NORTH DAKOTA.

Beulah.

Hall, Daniel Windsor. 1921

Bisbee.

Bugge, Peter O. 1920

Bismarck.

Finney, Burt. 1909

Lenhart, Amil P. 1920

Bowbells.

Donovan, Timothy M. 1922

Buffalo.

Macphail, John C. 1920

Cassellton.

Strehlow, H. R. 1918

Devil's Lake.

Engebretson, Elmer. 1918

Dickinson.

Orchard, Welland John. 1920

Enderlin.

Shirley, H. G. 1922

Fairmount.

Mergens, Peter. 1918

Fargo.

Benston, Bernard Leo. 1909

Casselman, Henry H. 1920

Cochrane, Labon C. 1920

Cook, Roy Gould. 1918

Hallenberg, Oscar. 1916

Ihlson, Phil R. 1920

Porterfield, Wm. Perry, Ph.G. 1909

Puhl, Richard H. 1920

Sigurdson, Arinbjoin S. 1922

Sister, Conchessa. 1922

Sudro, William F. 1918

Wilson, Phil R. 1920

Garrison.

Roehm, William Arthur. 1920

Golden Valley.

Halbeisen, Joseph George. 1922

Grafton.

Hatlelid, Ras O. 1922

Haussamen, Henry Louis, Ph.G. 1906

Grand Forks.

Vold, John N. 1916

Hansboro.

Blackburn, David A. 1920

Harvey.

Trachtenberg, Doris. 1922

Hebron.

Itrich, Waldemar H. 1922

Hettinger.

Harris, Thomas Spencer. 1920

Hunter.

Hamilton, Ziba Fred. 1920

Jamestown.

White, Herbert E. 1920

Kathryn.

Auderson, Knute. 1922

Kenmare.

Zuercher, Osear. 1920

Lakota.

St. John, Sidney I. 1922

Lankin.

Rinde, Samuel M. 1920

NORTH DAKOTA—OHIO.

<i>Larimore.</i>		<i>Sykeston.</i>	
Williams, Thomas R.....	1920	Wumkes, Peter E.....	1922
<i>Lisbon.</i>		<i>Tower City.</i>	
Parker, Wm. S.....	1918	Thompson, Carl McDonald....	1920
<i>Luverne.</i>		<i>Wahpeton.</i>	
Hendrickson, Hjalmar C.....	1920	Keen, John J.....	1920
<i>Mandan.</i>		<i>Westhope.</i>	
Homan, Frank P.....	1921	Findlay, Thomas A.....	1920
Shaffer, Frank L.....	1920	<i>Williston.</i>	
<i>Marion.</i>		Bradley, Ambrose Allen.....	1918
Hill, Homer L.....	1918	Kather, Erich.....	1920
<i>McVile.</i>		<i>Wimbledon.</i>	
Brakke, Nols N.....	1918	Lockett, George.....	1920
<i>Milnor.</i>			
Hoel, S. C.....	1920	OHIO.	
<i>Mormarth.</i>		<i>Ada.</i>	
Jorns, Gustave C.....	1920	Raabe, Rudolph Henry.....	1922
<i>Nekoma.</i>		<i>Akron.</i>	
Bilden, Paul.....	1920	Davis, Ernest C., Ph.C.....	1913
<i>Oakes.</i>		Howell, Ada Lee.....	1915
Simmons, Ingreold.....	1922	<i>Barnesville.</i>	
<i>Oberon.</i>		Ely, Ernest Sykes.....	1904
Oliver, M. H.....	1922	<i>Basil.</i>	
<i>Page.</i>		Johnson, Scott Wilber.....	1920
Foss, Palmer L.....	1919	<i>Bluffton.</i>	
<i>Pembina.</i>		Hauenstein, Armin Hermann....	1918
Stinson, Ray C.....	1922	Hauenstein, Sidney.....	1913
<i>Portal.</i>		<i>Brookville.</i>	
Reite, Andrew Martin.....	1920	Smith, Harry B.....	1920
<i>Ray.</i>		<i>Bucyrus.</i>	
Scott, Walter B.....	1920	Farquhar, William.....	1916
<i>Sheldon.</i>		<i>Canton.</i>	
Shelver, Wm. J.....	1922	Antony, Charles W.....	1915
<i>St. Thomas.</i>		Newman, Fred Wilbur.....	1922
Grant, Albert C.....	1920	<i>Cincinnati.</i>	
<i>Stanley.</i>		Apmeyer, Charles Ascau.....	1906
Eckstrom, Wm. J.....	1922	Austin, Edgar Covel.....	1921
<i>Sutton.</i>		Barkdell, Clifford C.....	1920
Gunderson, Alfred J.....	1922	Betz, Otto E.....	1916
		Blumenthal, Isadore F.....	1914
		Bolte, Frank.....	1916
		Cain, Frank B., M.D.....	1914

OHIO.

De Lang, Alfred.....	1915	Buckstein, Jacob.....	1920
Fennel, Charles Theo. P., Ph.G., Phar.D.....	1886	Catalano, Fabian Joseph.....	1920
Foertmeyer, Chas. Geo., Dr.....	1918	Cermak, Frederick Jefferson.....	1916
Freericks, Frank Herman, Ph.G., L.L.B.....	1905	Conrad, Alton F.....	1920
Freiberg, Ralph.....	1918	Curtis, Morris E.....	1915
Garber, Walter G.....	1920	Davidson, Aaron.....	1922
Grant, Ernest H.....	1920	Davy, Edward.....	1917
GREYER, JULIUS.....	1880	Ejbl, Anthony Bert.....	1920
Heinemann, Edwin.....	1913	Elkind, James George.....	1922
Heinritz, Frederick John.....	1920	Flandermeyer, August Louis, Ph.G.....	1910
Heister, Louis.....	1914	Ford, William H.....	1922
Helmsderfer, John C.....	1919	Fox, Willard Milton.....	1903
Kisker, F. W.....	1920	Green, Benjamin.....	1921
Lakamp, William.....	1913	Guenther, Harry F. J.....	1915
Lloyd, John Thomas.....	1920	Gusman, M.....	1920
LLOYD, JOHN URI.....	1870	Hagemeister, Walter F.....	1918
Mayo, Caswell Armstrong, Ph.M., Phar.D.....	1893	Hankey, William Tabor.....	1902
Merrell, Charles George, S.B....	1888	Hays, Ralph E.....	1921
Minster-Ketter, Frederick John..	1920	Hechler, Edward Henry.....	1904
Muehlberg, Victor Charles.....	1915	Hensge, William.....	1915
Murphy, Dennis E.....	1914	HOPP, LEWIS CHRISTOPHER.....	1876
Ott, Bertha (Miss).....	1913	Kobylanski, Zygmunt W.....	1920
Schaefer, Oscar William.....	1920	Kohl, John Henry.....	1920
Schneider, Joseph.....	1920	Lechner, Arthur Cyril.....	1921
Schulz, Robert A.....	1916	Lehr, Frank P.....	1915
Sellards, Horace W.....	1920	Loesch, Ellsworth.....	1920
Serrins, Geo.....	1918	Mackay, Paul Joseph.....	1921
Silber, Ferdinand P.....	1922	Margolis, Nathaniel H.....	1922
Thiesing, Edward Henry.....	1912	Mawrer, Albert J.....	1920
Voss, Edward Jr.....	1904	Muhlhan, Otto Emil.....	1905
Waltermann, Henry B.....	1918	Nesy, Albert.....	1916
Werner, Louis.....	1913	Pence, August Fred.....	1916
Wetterstroem, Caroline (Mrs.)..	1914	Placak, Harry, Ph.G.....	1902
Wiltsee, Lee.....	1920	Pollock, Henry.....	1916
Wittkamp, Clarence T.....	1915	Pope, Alva J.....	1919
Zuenkeler, John Ferdinand, Ph.G.	1887	Price, Arthur.....	1920
<i>Cleveland.</i>		Rabenstein, Edward, Jr.....	1915
Albrecht, Joseph.....	1920	Rauschfleisch, Edward C.....	1915
Bauer, John M.....	1920	Reed, James Garfield.....	1909
Baum, Maurice Albert.....	1920	Rigelhaupt, Adolph.....	1920
Belohoubek, George.....	1922	Rogoff, Elias M.....	1921
Benfield, Charles William.....	1893	Schoenhut, Christian Henry.....	1888
Benfield, Herbert E.....	1920	Selzer, Eugene Reinhold, Ph.C...	1893
Benfield, W. E.....	1920	Sherwood, Henry Jackson.....	1894
Bollinger, Clifford H.....	1912	Sister Mary Alma.....	1922
		Sollmann, Torald.....	1908
		Sords, Thomas Vincent.....	1893

OHIO.

Spease, Edward, B.Sc., Ph.C.	1912	<i>Kenmore.</i>	
Spenser, Mary H.	1916	Metzgar, Albert Paul.	1922
Stockhouse, F. William.	1915	<i>Lakewood.</i>	
Terry, Robert Wood.	1916	Gross, G. Wallace.	1919
Varga, Louis Nicholas.	1915	Zettelmeyer, Herbert.	1920
Walleck, Andrew E.	1912	<i>Lisbon.</i>	
Weinberger, Adolph.	1920	Hasbrouck, Donald West.	1922
Zickes, Elmer Joseph.	1916	<i>Marietta.</i>	
Zielinski, Max A.	1918	Dysle, John William.	1920
Zverina, Justin George.	1922	<i>Marion.</i>	
<i>Columbus.</i>		Osmun, Ralph Harper.	1921
Ackerman, Philip Jacob.	1906	<i>North Canton.</i>	
Bagley, Anna Gertrude.	1912	Schafer, Charles Henry.	1921
Braun, Carl L.	1915	<i>Norwood.</i>	
Brown, Clarence M.	1921	Bruker, J. Harry.	1918
Dye, Clair Albert.	1901	Sleight, F. H.	1920
Ford, Myron Nile.	1912	<i>Ravenna.</i>	
Hatton, Ellmore Wright.	1894	Lyon, Harold Morgan.	1919
Herpich, John Le Dure.	1906	<i>Sidney.</i>	
Marckworth, Otto Stanley.	1913	Christian, Forest D.	1916
SCHUELLER, FREDERICK WILLIAM	1880	<i>Springfield.</i>	
Topping, George Ballard, Ph.C. . .	1913	SIEGENTHALER, HARVEY NEW-	
Webb, Edward Nathan.	1905	TON.	1882
Wendt, William Carl.	1901	Westenfelter, Chas. W.	1916
Wetterstroem, Theodore David. .	1897	<i>St. Henry.</i>	
Wilfrid, Sister Mary.	1915	Link, Alexander J.	1917
<i>Conneaut.</i>		<i>Toledo.</i>	
Stines, Geo. F.	1918	Bowman, Waldo Moffet.	1905
<i>Dayton.</i>		Loesser, Paul A.	1915
Gallaher, J. Frank.	1921	Ludwig, William Edward.	1904
Jenkins, Elizabeth (Miss).	1913	Rupp, Walding G., Dr.	1918
Moosbrugger, Charles Otto.	1920	<i>Warren.</i>	
<i>East Liverpool.</i>		Leach, Raymond A.	1921
Halloway, Jesse Daniel, Ph.C. . .	1905	<i>Wyoming.</i>	
Johannes, Mrs. Ocy Crawford. . .	1922	Sanders, Harry Benjamin.	1916
<i>Elmwood Place.</i>		<i>Xenia.</i>	
Ryan, Florence Margaret.	1920	Donges, Wm. H.	1914
<i>Germanstown.</i>		<i>Youngstown.</i>	
Boehme, Lawrence Karl.	1921	Cassaday, Orlin Ulysses.	1899
<i>Glendale.</i>		Filsinger, Aurel Howard.	1921
Igler, Herman E.	1918	<i>Zanesville.</i>	
<i>Grand Rapids.</i>		Highfield, Herbert M.	1920
THURSTON, AZOR.	1886		

OKLAHOMA—OREGON—PENNSYLVANIA.

OKLAHOMA.

<i>Anadarko.</i>	
Nichols, Clarence Van Buren.....	1915
<i>Broken Arrow.</i>	
McAdams, Miss Winnifred.....	1920
<i>Caddo.</i>	
Dodd, William F.....	1919
<i>Cushing.</i>	
Freiday, Don S.....	1921
<i>Ft. Gibson.</i>	
Mosher, Donovan D.....	1918
<i>Fort Sill.</i>	
Goheen, Ira Lee.....	1916
<i>Haworth.</i>	
Woodson, George David.....	1920
<i>Hennessey.</i>	
Dinkler, Frank Adam.....	1900
<i>Muskogee.</i>	
Gotcher, Carl.....	1922
<i>Norman.</i>	
Baber, Charles.....	1922
De Barr, Edwin.....	1905
Hood, Fredrick Redding.....	1922
Johnson, David B. Ray.....	1921
Sargent, J. F.....	1920
Williams, Guy Randall.....	1921
<i>Oklahoma City.</i>	
Bethel, A. P.....	1920
Caldwell, H. S.....	1920
Jarrett, Walter R.....	1916
White, Louis Mortimore.....	1921
<i>Okmulgee.</i>	
Wallace, Arthur G.....	1920
<i>Quay.</i>	
Bergevin, Lawrence Lester.....	1920
<i>Shawnee.</i>	
Ashabrunner, Dudley.....	1921
<i>Stilwell.</i>	
Shaw, Dwight Beach.....	1921
<i>Weatherford.</i>	
Hudelson, F. H.....	1914

OREGON.

<i>Bend.</i>	
Morton, Richard D.....	1920
<i>Coquille.</i>	
Fuhrman, Cyrus Jacob.....	1915
<i>Corvallis.</i>	
McWilliams, Hershel Brian.....	1918
Strand, John Arnold.....	1921
Zieffe, Adolph.....	1910
<i>Pendleton.</i>	
Daley, Charles William.....	1920
<i>Portland.</i>	
Betzel, I. L.....	1916
Byerley, Fabian.....	1909
Clarke, Louis Gaylord.....	1909
Haack, Ludolph George.....	1909
Kiesel, J. G.....	1920
Nau, Frank.....	1918
Perusse, Francis Joseph.....	1915
Plummer, R. M.....	1919
<i>Salem.</i>	
Fry, Daniel Joshua.....	1917
<i>The Dalles.</i>	
Blakeley, George Clarence.....	1892
<i>Tillamook.</i>	
Clough, Charles Isaac.....	1915

PENNSYLVANIA.

<i>Allentown.</i>	
Waidelich, Harold Russell.....	1919
<i>Ambler.</i>	
Mattison, Richard V., M.D.....	1913
<i>Ambridge.</i>	
Phelan, Wm. J.....	1921
<i>Ashland.</i>	
Schoenenberger, August.....	1919
<i>Avoca.</i>	
Wallace, John A.....	1920
<i>Belle Vernon.</i>	
Wagner, Garrett Edward.....	1920
<i>Bethlehem.</i>	
Snyder, Harold Berlin.....	1918

PENNSYLVANIA.

<i>Birdsboro.</i>		<i>Dorrancetown.</i>	
Weidner, Elmer M.	1921	Wendell, Otto.	1920
<i>Bloomsburg.</i>		<i>Duncansville.</i>	
Moyer, W. V.	1920	Robertson, John H.	1918
<i>Braddock.</i>		<i>East Downingtown.</i>	
Kutscher, George William.	1905	Worrall, Wesley.	1919
Rock, John.	1922	<i>Easton.</i>	
<i>Bridgeport.</i>		Anspach, Paul Bucher, Ph.G.	1903
Law, Harold Noble.	1921	Schlabach, Cyrus L.	1914
<i>Camp Hill.</i>		Werkheiser, Harold Edwin.	1920
Wible, Hollis M.	1920	<i>Emaus.</i>	
<i>Carbondale.</i>		Schaeffer, Charles Raymond.	1920
Olmstead, David M., Ph.C.	1916	<i>Erie.</i>	
<i>Carlisle.</i>		Russell, Thomas J.	1920
HORN, WILBUR FISK.	1876	<i>Farrell.</i>	
Jacobs, Daniel L.	1920	Greenstone, Charles A.	1916
<i>Carrick.</i>		<i>Forty-Fort.</i>	
Kuenzig, Peter A.	1913	Heller, Theodore Rinehart.	1917
<i>Castle Shannon.</i>		<i>Frederick.</i>	
Doyle, Joseph Jesse.	1909	Ewe, George Elwood.	1919
<i>Chambersburg.</i>		<i>Gallitzin.</i>	
Wagaman, Emmett E.	1922	Reed, John Edwin.	1918
<i>Chester.</i>		<i>Germanatown.</i>	
Hendrickson, Raymond.	1916	Jenkins, William H.	1920
<i>Clearfield.</i>		Sarlo, Joseph.	1918
Ashcraft, Bernard Alfred.	1921	<i>Glenside.</i>	
Bloom, Cecil Read.	1917	Kohler, Charles.	1913
<i>Clifton Heights.</i>		<i>Greencastle.</i>	
Duvorsin, Agnes (Miss).	1916	Carl, Charles Blair.	1910
<i>Coaldale.</i>		<i>Grove City.</i>	
McElroy, David Gregory.	1921	De France, George W.	1910
<i>Columbia.</i>		<i>Hanover.</i>	
Zeamer, Harry Wisler.	1905	Britcher, Frank Neal.	1921
<i>Connellsville.</i>		<i>Harrisburg.</i>	
Keagy, Elwood Milton.	1918	Goodyear, Wilbur B.	1915
<i>Coopersburg.</i>		GORGAS, GEORGE ALBERT.	1884
Koch, Howard Jonathan.	1916	Huber, Donald Witherow.	1918
<i>Cynwyd.</i>		Knouse, John A.	1920
Campbell, S. Ross.	1916	Kramer, Charles F.	1910
<i>Dallastown.</i>		Schampau, Alex.	1920
Hartman, Jennings B.	1920	Senseman, W. Thos., Jr.	1920
		Smith, Benjamin Franklin.	1892
		Steever, William Forsaith.	1920

PENNSYLVANIA.

<i>Hatboro.</i>		<i>Media.</i>	
Rothwell, Walter.....	1907	Roberts, John Griffith.....	1914
<i>Hyndman.</i>		<i>Minersville.</i>	
Rhodes, Charles Reynolds.....	1918	Kiltisch, Charles J.....	1919
<i>Irwin.</i>		<i>Mt. Carmel.</i>	
Kuhn, Ralph Alfred.....	1921	Pachuta, Michael.....	1919
<i>Juniata.</i>		<i>Nazareth.</i>	
Haberstroh, Ambrose Rea.....	1921	Heckman, Paul Willard.....	1921
<i>Kingston.</i>		<i>New Castle.</i>	
Lohmann, John.....	1904	Wallace, Mrs. Emma K.....	1922
Mazanowski, Edw. C.....	1919	Wallace, John Crawford, Phar.D.	1905
<i>Kittanning.</i>		<i>New Cumberland.</i>	
Eckbert, Charles Ryan.....	1917	Good, Jacob Edison.....	1916
Sturgeon, Walter J.....	1914	<i>Newport.</i>	
<i>Lancaster.</i>		Bosserman, Charles Emmett....	1918
Frailey, William Otterbein.	1903	<i>New Ringgold.</i>	
Knight, Harry M.....	1920	Shoemaker, Harold Adam.....	1921
<i>Lebanon.</i>		<i>Norwood, Delaware Co.</i>	
LEMBERGER, JOSEPH LYON,		Borneman, John A.....	1922
Ph.G., Ph.M.....	1858	<i>Ogontz.</i>	
Schaak, Milton Franklin.....	1906	Clayton, Abram Theophilus....	1906
<i>Lehighton.</i>		<i>Oil City.</i>	
Moyer, Lloyd R.....	1921	Gaddess, John.....	1908
Wagner, Clarence K.....	1921	<i>Olney.</i>	
<i>Lewistown.</i>		Neiffer, Grover Wellington.....	1920
Zook, Carl E.....	1920	<i>Parkersburg.</i>	
<i>Luzerne.</i>		Hawk, Asher Miller.....	1920
Haight, A. C.....	1918	<i>Philadelphia.</i>	
<i>Llanrech.</i>		Aidenbaum, Philip Lincoln.....	1919
Morse, Horace B.....	1921	Baer, Jacob Michael.....	1902
<i>Lock Haven.</i>		Baker, Benjamin.....	1919
Staub, Brown Charles.....	1921	Barol, Alfred.....	1922
<i>Manheim, Lancaster Co.</i>		Bell, Harry.....	1920
Ruhl, Harry Frey.....	1902	Bernstein, Mitchell.....	1918
<i>McKeesport.</i>		Blackwood, Russell Thorn.....	1907
Manns, Walter E.....	1922	Blaustein, Louis Nathan.....	1921
Schmidt, Adolph.....	1916	Bongiovanni, Joseph Nathaniel..	1916
<i>McKees Rocks.</i>		Brinton, Clement Starr.....	1906
Sandles, Van Amburg.....	1909	Brisson, Alfred Frederick.....	1916
<i>Meadville.</i>		Busch, Henry Paul.....	1910
U'tech, P. Henry, Ph.C.....	1907	Busch, Miers.....	1903
		Cadmus, Robert Clark.....	1906

PENNSYLVANIA.

Cahan, Samuel.....	1915	Haldeman, Glenn Arthur.....	1920
Campbell, Milton.....	1902	Hall, Wm. Daniel.....	1915
Campbell, Theodore.....	1902	Harbold, Curtis Alexander.....	1907
Cliffe, William Lincoln.....	1898	Hargreaves, Lottie.....	1920
Coleman, David.....	1920	Harrison, Joseph Whipple Eugene.....	1918
Cook, E. Fullerton, P.D.....	1901	Harvey, Gilbert.....	1920
Cravens, John Goldsmith.....	1916	Harvey, J. Parker.....	1921
Daly, Thomas Joseph.....	1920	Haussman, Frederick William....	1895
Dean, J. Atlee.....	1914	Hertzler, Gains B.....	1920
Decker, Robert William.....	1907	Hires, Charles E.....	1916
Derrico, Anthony.....	1921	Hoch, Quintus.....	1907
Dorfman, Rudolph K.....	1918	Hoffman, Charles Elbert.....	1917
EBERLE, EUGENE GUSTAVUS, Ph.M.....	1896	Hunsberger, Ambrose.....	1905
Eberly, Earl.....	1919	Ikan, Albert L.....	1916
Edge, Nicholas Joseph.....	1920	Jaffe, Hyman.....	1919
Ehman, Joseph W.....	1918	Jones, Amos.....	1915
Ehmann, Karl Francis.....	1916	Josephs, Aaron Harry.....	1920
Elliott, Charles S.....	1914	Kahn, Solomon Karl.....	1905
ENGLAND, JOSEPH WINTERS.....	1893	Kane, Joseph Thomas.....	1920
Eppley, Joseph A.....	1919	Kauffman, Irwin Harry.....	1921
Eskin, Sarah.....	1918	Kendig, H. Dvert.....	1916
Ewing, Herbert Martin.....	1920	Kercher, Edwin Harry, Ph.G.....	1907
Evans, George Bryan.....	1902	Kirby, Charles P.....	1909
Ferguson, James A.....	1913	Kline, Clarence Mahlon, Ph.B....	1902
Fisher, Henry, M.D.....	1916	Klopp, Henry L.....	1913
Foran, Ralph Richard.....	1919	Koch, Charles N.....	1921
Fox, Sereck Hall.....	1921	Koenig, Otto L., Jr.....	1919
Freeman, Lewis Good.....	1920	Kramer, Nathan H.....	1920
French, Harry Banks.....	1890	Kwiatkowski, Adam J.....	1920
French, Howard Barclay.....	1906	Lackey, Richard Henry.....	1907
Friedman, William Leonard....	1918	Lantz, William Henry.....	1908
Furman, Frank H.....	1921	LaWall, Charles Herbert, Ph.M....	1896
Gallagher, Pierce James.....	1921	LaWall, Millicent Renshaw (Mrs.), P.D.....	1905
Galloway, Clarence Moore.....	1920	Lerner, Albert.....	1921
Gano, William Hubbell, Ph.G....	1892	Levin, Sarah.....	1920
Garvey, James Aloysius, P.D....	1909	Lieber, Maurice L.....	1920
Gershenfeld, Louis.....	1915	Maguire, Raymond Francis.....	1920
Githens, Thomas Stotesbury....	1900	Mallard, Oscar Paul.....	1916
Glantz, Morris.....	1921	Martinez, Carmen A.....	1920
Glass, Raphael.....	1919	Matusow, Harry, Ph.G.....	1897
Goodhart, Brua Clifford.....	1918	McAllister, Lory Curley.....	1920
Graham, Willard.....	1902	McCauley, William Aloysius....	1919
Green, Samuel.....	1919	McNeary, Wm. Wilson.....	1915
Griffith, Ivor.....	1916	Mellor, Alfred.....	1864
Gross, David.....	1920	Merklee, Benjamin Franklin....	1919
Gutzeit, Charles Samuel.....	1921		
Hahn, Edward T.....	1918		

PENNSYLVANIA.

MILLER, ADOLPHUS WILLIAM, Ph.G., M.A., Ph.D.....	1868	Slatter, Charles F.....	1921
Minehart, John Roy.....	1905	Smith, Howard E.....	1910
Moerk, Frank Xavier, Ph.G., Ph.M.....	1898	Smith, Mortimer Mann.....	1921
Molloy, John J.....	1920	Smith, Walter Valentine.....	1902
Morgan, Frank E., Ph.G., Phar.D.....	1906	Staudt, Albert John.....	1907
Morrison, Frederick Raymond...	1921	Stein, Milton.....	1918
Mulford, Henry Kendall.....	1896	STEWART, FRANCIS EDWARD....	1884
Mulford, Henry Kendall, Jr....	1916	Streep, Frank Park.....	1907
Nebig, William George, Ph.G....	1907	Stroup, Freeman Preston, Ph.M..	1900
Neff, Harry.....	1921	Sutom, Ko.....	1921
Nichols, Adley Bonisteel.....	1918	Thum, John Karl, Ph.G.....	1905
Noble, Joseph W.....	1920	Townsley, George Tripp.....	1920
Novack, Harry J., M.D.....	1916	Truby, Miriam Grace (Miss)....	1914
Noveck, Morris.....	1921	Vogel, Mary Lynch (Mrs.).....	1920
Osterlund, Otto William.....	1902	Wallace, George R.....	1914
Pachali, Theodore, Jr.....	1907	Wear, John.....	1918
Peacock, Bertha Leon (Mrs.), Ph.G.....	1895	WEIDMANN, CHARLES ALEXAN- DER, Ph.G., M.D.....	1868
Peacock, Josiah Comegys, Ph.G.	1892	Weidman, I. S.....	1919
Pearson, William Alexander....	1908	Weisner, Nicholas Frederick....	1909
Penn, Leo G.....	1920	White, Robert C.....	1918
Oswald, Anthony Cyril.....	1920	Whitehill, John.....	1920
Pittenger, Paul Stewart, Ph.G., Ph.C., Phar.D.....	1911	Wood, Horatio C., Jr., M.D.....	1906
POLEY, WARREN HENRY.....	1906	Whyte, Hilson H.....	1920
Rabinowitz, Abraham.....	1918	Worthington, John Warren Wolfe	1912
Rapoport, Julius G.....	1918	Wyman, Abraham.....	1921
Raymond, Henry S.....	1920	Yarp, Mrs. Ruth C.....	1918
Reese, David J.....	1915	Youngken, Herber Wilkinson, A.B., A.M., Ph.G.....	1912
Rehfuß, Charles.....	1908		
Reif, Ernest.....	1915	<i>Pittsburgh.</i>	
Reigher, Wm. Erle.....	1919	Bluestone, Isadore.....	1916
Rosengarten, Adolph G.....	1913	Blumenschein, Frederick John...	1904
Rosengarten, Frederick.....	1913	Burkett, K. S.....	1915
Rosengarten, George David....	1902	Burrier, Anna Zoe.....	1922
Rosengarten, J. G.....	1913	Busis, David.....	1920
Rosin, Joseph.....	1914	Darbaker, Leasure Kline, Ph.G., Phar.D.....	1909
Sanders, Annetta Mildred.....	1920	EMANUEL, LOUIS.....	1878
Seidman, Harry.....	1911	Gilleland, John Roy.....	1914
Seltzer, Joseph Pincus.....	1919	Harvitz, Max.....	1922
Seraballs, Enrique Aulet.....	1920	Hofmeister, Ralph Richard....	1920
Siegfried, Howard J.....	1907	Janda, Thomas John Joseph....	1913
Silk, Jacob.....	1920	Judd, Albert Floyd.....	1901
Simpson, Nathan Alexander....	1916	Koch, Julius A.....	1892
Simpson, Robert.....	1913	Kossler, Herman Stanislaus....	1905
		Kretz, Edward John.....	1909
		Lohmeyer, Henry L.....	1910

PENNSYLVANIA.

McNulty, James C.....	1909	<i>Shamokin.</i>	
Meyers, Alexander.....	1920	Lehr, Irwin E.....	1921
Mierzwa, Richard.....	1908	Reidinger, Laurence Ernest.....	1921
Miller, Charles Jacob.....	1922	<i>Spring Grove.</i>	
Miller, Joseph J.....	1918	Myers, William Bryan.....	1920
Nied, Mrs. Helen Edna.....	1921	<i>Susquehanna.</i>	
O'Brien, Robert Stephen.....	1921	Reddon, Frank J.....	1920
Prichard, Benjamin Elliott.....	1908	<i>Swissvale.</i>	
Reif, Dr. Edward Clarence.....	1921	Crawford, Harry R.....	1921
Rodemoyer, William Edward...	1901	<i>Towanda.</i>	
Saalbach, Carl, Ph.G.....	1908	PORTER, HENRY CARROLL.....	1872
Saalbach, Louis, Ph.G., Phar.D..	1907	<i>Tremont.</i>	
Schaefer, Charles Henry, Ph.G...	1909	Schultz, Anna.....	1918
Schaefer, Emil August, Phar.D...	1900	<i>Uniontown.</i>	
Sister M. Casilda Ruewe.....	1922	Zacovic, Andrew.....	1918
Snyder, Goldie Esther.....	1921	<i>Washington.</i>	
Walter, Peter Grant, Ph.G.,		Vowell, Louis Sweitzer.....	1905
Phar.D.....	1905	<i>Waynesboro.</i>	
Webber, Thelma.....	1920	Coffman, Charles Wayne.....	1920
Weimer, Roth Eardon.....	1918	<i>West Hazleton.</i>	
Weissmiller, Paul V.....	1920	Brown, Donald J.....	1920
Wurdack, John Herman.....	1909	<i>W. Pittston.</i>	
Zeman, Isador Louis.....	1920	Evans, Samuel Morgan.....	1918
<i>Pittston.</i>		<i>Wilkes-Barre.</i>	
Kane, James F.....	1919	Aston, E. Arthur.....	1916
<i>Plymouth.</i>		Bennett, Henry.....	1920
Evans, Thos. J.....	1919	Burke, Mark.....	1919
Groblewski, Alphonse Paul.....	1921	Cohen, Harry A.....	1921
Groblewski, G.....	1919	Filar, Louis L.....	1919
Harris, R. A.....	1919	Frank, Louis.....	1914
<i>Pottstown.</i>		Gallagher, G. J.....	1918
Detweiler, Howard Werstler, Jr..	1920	Goulden, Frank.....	1920
<i>Pottsville.</i>		Greenstein, Norris.....	1918
DEIBERT, THOMAS IRWIN.....	1882	Hufford, H. S.....	1918
<i>Reading.</i>		Hughes, John J.....	1919
Ziegler, Howard Philip.....	1905	Mebane, R. Ramsey.....	1919
<i>Renovo.</i>		Meyer, J. Gross.....	1920
Carstater, James C.....	1920	Morgan, A. D.....	1920
<i>Ridgway.</i>		Shovlin, John J.....	1919
Ross, Paul Hanson.....	1921	White, W. D.....	1918
<i>Scranton.</i>		Williams, Daniel T.....	1919
Brown, Andrew.....	1915	<i>Wilkesburg.</i>	
Gardier, Louis.....	1919	Baier, Albert E.....	1918
Knoepfel, William Henry.....	1909		

PENNSYLVANIA—PHILIPPINE ISLANDS—PORTO RICO—RHODE ISLAND—SOUTH
CAROLINA.

Williamsport.

Walton, Lucius Leedom, Ph.G.,
Ph.M., Phar.D. 1904

York.

Leber, Jacob Gilbert 1905
Moore, Clair Channell 1920
Shearer, George Keyworth 1917

PHILIPPINE ISLANDS.

Manila.

Castillo, y Alisango Eduardo 1920
Imson, Juan Rosales 1960

PORTO RICO.

Ceiba.

Salinas, Miguel Saavedra 1918

Fajardo.

Veve, Miguel A. 1918

Georgetti, Humacao.

Moscoso, Gustavo 1922

Mayaguez.

Mulet, Luis 1918

San-Sebastian.

Cabrero, Narcisco Rabell 1915

RHODE ISLAND.

East Greenwich.

Earnshaw, Arthur Morris 1921

Harvard.

Boren, Walter Theodore 1922

Narragansett Pier.

Davis, Peter Bernard 1909

Newport.

Benton, William Mayze 1919

Bigelow, Allen Franklin 1920

French, Leon Hermann 1917

Pawtucket.

Morgan, George Smith 1909

Phillips, Wendell E. 1918

Tyler, Earl Albert 1916

Providence.

Anthony, Edwin Perkins 1909

Blanding, William Oliver 1894

Clafin, Albert Whitman 1913

Corrigan, Michael Henry 1913

Haynes, Herbert 1908

Mason, E. H. 1920

Pearce, Howard Anthony 1894

Reiner, Nicholas F. 1913

SOUTH CAROLINA.

Bamberg.

McCrackin, Furman Butler 1919

Bennettsville.

Matthews, Odell Atwood 1920

Charleston.

Aimar, Arthur P. 1920

Harper, William George 1920

Hyde, Joseph Bell, Jr., Ph.G. 1909

Jordan, John M. 1916

Smith, Frank M. 1920

Zeigler, Washington Hayne 1915

Columbia.

Otis, Robert Kinlock 1921

Conway.

Platt, Vivian Francis 1921

Elloree.

Dantzler, Marion S. 1920

Florence.

Darby, William Henry, Jr. 1921

Riley, David Tilden 1920

Smith, James Fillmore 1921

Smith, Thomas Benjamin 1920

Walsh, Edward Porchet 1921

Greenwood.

Coleman, Arno A. 1916

Hodges, Samuel Connor 1920

Greenville.

Bates, John 1920

Bruce, Joseph B. 1920

Honea Path.

Donnald, S. D. 1920

Jonesville.

Ellerbe, Frank M. 1921

Lawrens.

Bishop, Lester E. 1920

SOUTH CAROLINA—SOUTH DAKOTA.

<i>Pelzer</i>		<i>Henry</i>	
McBrearty, John Henry	1920	Aldons, John C	1920
<i>Pickens</i>		<i>Herreid</i>	
Yongue, James Douglas	1918	Blair, John H	1922
<i>Seneca</i>		<i>Herrick</i>	
Stribling, Thos. Leslie	1920	Bryant, Francis Asbury	1920
<i>Sumter</i>		<i>Hot Springs</i>	
DeLoame, J. Grenville	1920	Brown, Floyd Woodford	1910
<i>Wilmington</i>		Hazeldine, Earl L	1918
Duckett, Robert Maxwell	1920	Highlye, L. E	1913
SOUTH DAKOTA		<i>Kindred</i>	
<i>Aberdeen</i>		Straehlow, Max Henry	1922
Staley, James M	1920	<i>Mellette</i>	
<i>Artisan</i>		Ross, John J	1922
Howell, Henry Saxton	1922	<i>Milbank</i>	
<i>Big Stone City</i>		Leavitt, Ethel M	1920
Clate, Perry H	1920	<i>Miller</i>	
<i>Benetown</i>		Wilcox, Guy Wilber	1920
Kenaston, Hampton Ray (Mrs.),		<i>Mitchell</i>	
B. E., M. E.	1914	Scallin, Stephen Harmon	1910
<i>Beauville</i>		<i>Pierre</i>	
Maas, Henry Conrad	1910	Vilas, Fred L	1918
<i>Brookings</i>		<i>Rapid City</i>	
Hogstad, Anton, Jr	1918	March, Leonard W	1920
Riley, Miss Edna	1921	<i>Redfield</i>	
Series, Earl R	1920	Pool, James Arthur	1918
<i>Centerville</i>		Warne, Cyrus B	1922
Heider, John Emery	1910	<i>Reliance</i>	
<i>Crested</i>		Williams, Geo	1922
Bittner, Albert O	1921	<i>Sioux Falls</i>	
<i>Dell Rapids</i>		Bernhart, Peter Kristoffer, Ph.G.	1910
Bent, Edward Clarence	1915	Finstad, A	1920
<i>Eden</i>		<i>Sturgis</i>	
Landsberger, Theodore D	1920	Peterson, Henrick J	1920
<i>Estelline</i>		<i>Timber Lake</i>	
Hofelt, Edward	1910	Prann, Wilbur E	1920
<i>Garrison</i>		<i>Vienna</i>	
Johnson, Ole	1922	Eng, Julius C	1922
<i>Gary</i>		<i>Waubay</i>	
Fouger, James H	1922	Ronning, Ole P	1920

SOUTH DAKOTA—TENNESSEE—TEXAS.

<i>Watertown.</i>		Hubbard, George Whipple.....	1913
Jones, David Franklin.....	1895	Johnson, Phil D.....	1920
Zieske, Arthur, Ph.G.....	1910	Kremers, Roland Edward.....	1920
<i>Winchester.</i>		Kuhn, David Jacob.....	1920
Prince, Clofton O.....	1914	Pully, Luther Smith.....	1910
<i>Woonsocket.</i>		Smith, Frank Leslie.....	1910
Freese, Arthur Carl.....	1921	Weise, Carl E.....	1914
<i>Yankton.</i>		White, William Rufus, Ph.C.....	1904
Vanderhule, Geo. W.....	1920	<i>Newbern.</i>	
TENNESSEE.		Westbrook, Charles Gray.....	1912
<i>Centreville.</i>		<i>Sharon.</i>	
Coble, Hartie Lorenzo.....	1920	Shannon, Thomas J.....	1905
<i>Chattanooga.</i>		<i>Somerville.</i>	
Higgins, S. B.....	1920	Rhea, Howard M.....	1914
Maines, Eugene L.....	1912	<i>Union City.</i>	
Voight, Joseph Frederick.....	1893	Oliver, Henry Madison.....	1920
<i>Clarksville.</i>		TEXAS.	
Coulter, George W.....	1917	<i>Amarillo.</i>	
<i>Dyersburg.</i>		Collins, Josiah Wm.....	1922
Lipscomb, W. L.....	1914	<i>Austin.</i>	
<i>Henning.</i>		Graham, J. W.....	1916
Turner, Thomas David.....	1918	<i>Bartlett.</i>	
<i>Humboldt.</i>		Leatherman, D. K.....	1920
Nooner, Thompson A.....	1914	<i>Batson.</i>	
<i>Johnson City.</i>		Teel, William Polk.....	1920
Whitehouse, Harry.....	1917	<i>Bay City.</i>	
<i>Knoxville.</i>		Huston, Peacher Grattan.....	1920
Brown, Frank S.....	1914	<i>Brownsville.</i>	
Rosenthal, David Abraham,		Willman, William George.....	1904
Ph.G.....	1894	<i>Brownwood.</i>	
<i>Memphis.</i>		Hallum, Charles M.....	1920
Cox, Wiley Jones.....	1920	<i>Childress.</i>	
Crowe, Robert Latta.....	1914	Roberson, Tom J.....	1921
ROBINSON, JAMES SCOTT.....	1869	<i>Cleveland.</i>	
Sheely, Edward Valentine.....	1918	McMahon, J. D.....	1920
Trotter, Charles Kirkwood.....	1920	<i>College Station.</i>	
<i>Murfreesboro.</i>		Blackberg, Solon Nathaniel.....	1920
Kerr, Bryon Broough.....	1920	<i>Crockett.</i>	
<i>Nashville.</i>		Bishop, William Penn.....	1914
Clark, Ira Benton.....	1900	<i>Cuero.</i>	
Deason, Henry Rushing.....	1920	Duggan, John Marion.....	1920

TEXAS.

<i>Dallas.</i>		Jacobs, D. E.....	1920
Coulson, James Thomas.....	1906	Lewyn, Isadore.....	1920
Cousins, Walter Henry.....	1915	<i>Italy.</i>	
De Lorenzi, Albert.....	1890	Jenkins, Cecil Lester.....	1921
Duncan, C. A.....	1921	<i>Knox City.</i>	
Fletcher, Joel Morgan.....	1915	Frizzell, T. P.....	1920
Long, Eugene Hughes.....	1919	<i>Lockhart.</i>	
Mitchell, Lloyd Benjamin.....	1912	Westmoreland, Edwin Reese,	
Skillern, W. A.....	1920	Ph.G.....	1910
Urbish, A. J.....	1918	<i>Lubbock.</i>	
<i>Dilley.</i>		Duering, Henry Charles.....	1901
Breining, M. H.....	1916	<i>Manor.</i>	
<i>El Paso.</i>		Wentland, William Henry.....	1914
Sister Marie Collens.....	1922	<i>Megargel.</i>	
<i>Encinal.</i>		Spoontz, J. M.....	1921
Guerrero, Juan Cantu.....	1911	<i>McKinney.</i>	
<i>Farmersville.</i>		Dulaney, Joseph Field, P.D.....	1902
Rike, Zeb W.....	1916	<i>Nordheim.</i>	
<i>Flatonia.</i>		Brunkenhoefer, Fred.....	1920
Mikulik, Ed. M.....	1920	<i>Orange.</i>	
<i>Forney.</i>		Gorgee, Robt. B.....	1921
Adams, Walter Dickson.....	1913	Huddle, Hunter.....	1920
<i>Galveston.</i>		<i>Port Arthur.</i>	
Buckner, John Clark.....	1905	Smith, Josiah Green.....	1922
Koester, Hermann.....	1910	<i>San Angelo.</i>	
Wilder, Gaston H.....	1916	Butterly, Lester Le Roy.....	1916
<i>Garwood.</i>		<i>San Antonio.</i>	
Pinchback, J. R., Jr.....	1920	Bartlett, John L.....	1921
<i>Giddings.</i>		Dreiss, Hermann E. F., Ph.G....	1912
Hielscher, H. E.....	1922	Fischer, Albert Martin.....	1915
<i>Gonzales.</i>		Hein, Henry F.....	1918
Walker, Robert Hamilton, B.S.,		Nester, Herman August.....	1909
Ph.M.....	1907	Pfeiffer, John.....	1918
<i>Graham.</i>		Prassel, Frank.....	1919
Long, Kenion Adam.....	1921	Saccar, Michael, Ph.G.....	1905
<i>Groveton.</i>		Simon, Leopold.....	1922
Linder, W. T.....	1920	Staffa, August E.....	1915
<i>Henderson.</i>		<i>San Marcos.</i>	
Cameron, J. L.....	1922	Shipe, Columbus A. (Miss).....	1914
<i>Houston.</i>		<i>Spearmen.</i>	
Dwyer, Frank B.....	1915	Clark, Willis Anthony.....	1918
Harris, C. C.....	1922		

TEXAS—UTAH—VERMONT—VIRGINIA.

<i>Taylor.</i>	
Carleton, Henry Lincoln.....	1910
<i>Terrell.</i>	
Overstreet, George Thomas.....	1921
<i>Texarkansas.</i>	
Carrol, Paul Douglass.....	1920
<i>Texline.</i>	
Dyche, Wm. E.....	1915
<i>Troupe.</i>	
Ogletree, William Dulaney.....	1920
<i>Vernon.</i>	
Brown, Robert Owen.....	1914
<i>Victoria.</i>	
Parker, Emery William.....	1921
<i>Yoakum.</i>	
Koerth, Emil Christian.....	1910

UTAH.

<i>Brigham.</i>	
Eddy, Wynn Leland.....	1908
<i>Logan.</i>	
Riter, Benjamin Franklin.....	1910
<i>Ogden.</i>	
Culley, John, Ph. G.....	1908
<i>Salt Lake City.</i>	
Dayton, Walter Henry, Ph.G....	1908
Emberg, Andrew F.....	1921
Harms, Herman E.....	1908
Swingle, Leroy Dey.....	1917
Thompson, Harry Laudis.....	1917

VERMONT.

<i>Barton.</i>	
Pierce, Fred D.....	1909
<i>Burlington.</i>	
Zottman, Wm. H.....	1918
<i>Marshfield.</i>	
Gilman, Elbridge Wheeler.....	1907
<i>Montpelier.</i>	
Slade, Henry Allen.....	1899
<i>Morrisville.</i>	
Cheney, Arthur Lewis.....	1907

<i>Newport.</i>	
Livingston, Urban Smith.....	1920
<i>Rutland.</i>	
McClallen, E. Gregory.....	1912
<i>St. Johnsbury.</i>	
BINGHAM, CHARLES CALVIN.....	1875
Eastman, Welcome B.....	1912
<i>Windsor.</i>	
Spaulding, Ralph G.....	1921

VIRGINIA.

<i>Appomattox.</i>	
East, H. Sheldon.....	1922
<i>Blacksburg.</i>	
Pedigo, Charles Lewis.....	1921
<i>Bridgewater.</i>	
Furry, Bernard Poole.....	1921
<i>Buchanon.</i>	
Henderson, Frank R.....	1922
<i>Charlotte.</i>	
Williams, Walter G.....	1920
<i>Chase City.</i>	
Saunders, Hilda (Miss).....	1920
<i>Chatham.</i>	
Thompson, G. E.....	1918
<i>Chilhowie.</i>	
Greever, E. V.....	1920
<i>Christiansburg.</i>	
Miller, Robert Leroy.....	1920
<i>Coeburn.</i>	
Martin, Thomas Fairfax.....	1919
<i>Colburn.</i>	
Scott, John C.....	1920
<i>Crozet.</i>	
Clark, Andrew J.....	1920
<i>Culpepper.</i>	
Kelly, Mason Powhatan.....	1920
Smith, William Adelbert.....	1920
<i>Dante.</i>	
Haley, Henry T.....	1920

VIRGINIA.

<i>Danville.</i>		<i>Petersburgh.</i>	
Clanton, Jesse Turner.....	1920	Bowman, Robert Lee.....	1920
McCall, V. W.....	1921	Congdon, Frank Carr.....	1920
<i>East Radford.</i>		Crump, Edwin Adams.....	1920
Hopkins, John C.....	1920	Guthrie, Charles Luther.....	1920
<i>Farmville.</i>		Knock, Thomas Franklin.....	1911
McIntosh, Frank W.....	1920	Partin, Robert Nelson.....	1920
<i>Franklin.</i>		Smith, Robert Blackwell.....	1920
Gilliam, R. Carlisle.....	1920	Totty, Richar Robinson.....	1920
<i>Fredericksburg.</i>		<i>Portsmouth.</i>	
Bowman, Dwilt Clinton.....	1920	Brannon, Boyce L.....	1922
<i>Gate City.</i>		Clark, W. D.....	1920
Johnson, Geo. W.....	1920	Darden, Peter E.....	1920
<i>Hampton Roads.</i>		Schreurs, H. B., H. S., U. S. N...	1917
Swan, Edwin Garner.....	1919	<i>Pulaski.</i>	
<i>Harrisonburg.</i>		Seagle, Dexter E.....	1918
Avis, James Little.....	1905	<i>Purcell.</i>	
Williamson, J. W.....	1919	Monroe, John T.....	1920
<i>Leesburg.</i>		<i>Radford.</i>	
Littlejohn, Horace.....	1918	Osborne, Melmoth Mercer.....	1906
<i>Meadow View.</i>		<i>Richmond.</i>	
Francis, Rozier L.....	1920	Beach, Clifford H.....	1919
<i>Millboro Springs.</i>		Bird, Lloyd Campbell.....	1920
Lowman, Jas. Lewis.....	1922	Blair, Gordon.....	1920
<i>Norfolk.</i>		Briggs, Andrew Gessner.....	1890
Coleman, John D.....	1920	Britton, F. J.....	1920
Goldsborough, Charles Henry...	1898	Crockett, William Goggin.....	1920
Kephart, Walter Jacob.....	1921	Curd, Thomas Nelson.....	1907
Kimball, Chester Orvis.....	1916	Dukenson, Forrest Baldwin....	1920
Lindh, Berger.....	1918	Fackenthall, Philip Frederic....	1920
Morcellus, Miller.....	1920	Farley, Leon Joseph.....	1920
Nelligar, Frederick Dennis.....	1907	Gilkeson, Robert Vance.....	1920
Savage, Margaret E.....	1921	Gwathmey, Richard.....	1920
Stier, Carl, Ph.G.....	1902	Johann, Adam Ernest.....	1910
Thome, Charles Carroll.....	1920	Johann, Ernest George.....	1920
Walker, Robert Lee.....	1920	Keys, Joe.....	1920
Wierzbicki, Stephen.....	1919	Lichtenstein, Julian.....	1918
Wilson, Edward Claudius.....	1919	Lyle, James Albert.....	1920
Wolfe, Jos. Albert.....	1916	Miller, Roshier W.....	1920
<i>Pennington Gap.</i>		Miller, Turner Ashby, Ph.G....	1894
Parsons, R. C.....	1920	Miller, W. C.....	1920
		Monroe, Roger E.....	1918
		Phipps, Morris.....	1917
		Pryde, J. Richard.....	1920
		Rudd, Wortley Fuller.....	1915
		Seawell, Hallie Chris.....	1921

VIRGINIA—WASHINGTON.

Spence, Chas. Aubrey, Jr.	1920
Taylor, Edgar Darby.	1910
Thomas, William McClurg.	1919
Traylor, C. B.	1920
Varlet, Miss F.	1920
Varlet, Miss S.	1920
Walker, Charles F.	1919
Weinstein, Samuel.	1919
Winne, Arthur L. I.	1920
Wood, Carroll E.	1918
Woody, Sam B.	1920
Worsham, John T.	1920

Roanoke.

Fox, Charles Dunsmore.	1921
Lambert, Maud, Ph.G.	1915

Rocky Mount.

Darr, Oscar S.	1920
Martin, John O.	1922

Scottsville.

Butler, Lindsay Wesley.	1922
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Shenandoah.

Hudson, Edgar Yeager.	1918
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South Boston.

Reeves, W. T.	1920
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South Hill.

Burnett, Benjamin Edward.	1920
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Tazewell.

Jackson, John Edward.	1918
Perry, J. O'Keeffe.	1920

Timberville.

Andes, Garrett E.	1922
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Wakefield.

Foley, Benjamin F., Jr.	1921
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Warwick.

Creasy, Samuel Curtis.	1920
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Williamsburg.

Hurt, Robert H.	1920
Lacy, George Evans.	1920

Winchester.

Holtzman, Joseph Harrison.	1919
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Woodstock.

Clower, Joseph B.	1919
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WASHINGTON.

Bellingham.

Clothier, Lyle Bell.	1921
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Centralia.

Garrison, Dayton Burt, Jr., Ph.G.	1913
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Colfax.

McCroskey, Virgil T.	1915
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Granite Falls.

Schlack, Walter Henry.	1921
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LaCrosse.

Victor, Paul.	1921
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Puyallup.

Truedson, Eric P.	1904
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Seattle.

Blalock, Jesse Nelson.	1909
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Curtis, Stanley W.	1921
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Fenlon, Edwin Whitney.	1920
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Gilliland, William Lester.	1920
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Guy, George H.	1921
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Hendricks, William E.	1921
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HOLMES, HENRY ELLIOTT.	1880
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Jamieson, Francis Thomas.	1920
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Johnson, Charles Willis, Ph.C., B.S., Ph.D.	1903
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Kinne, Clare Bernard.	1920
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Linton, Arthur Wilson.	1901
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Lofgren, Frederick Valentine.	1920
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Needham, George Herbert.	1920
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Orosa, Maria Ylagan.	1920
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Osseward, Cornelius, Ph.C.	1897
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Patty, F. Arthur.	1921
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Roberts, Mrs. Elizabeth.	1920
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Rubenstein, Louis.	1909
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Vanderbilt, Mrs. John W.	1920
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Watson, Joseph Ruerson, Ph.C.	1904
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Wilkes, Miss Jean Robin.	1920
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South Bend.

Shone, Bessie Mabel.	1920
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Spokane.

Brown, George Elmer.	1920
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Duerfeldt, Henry George.	1916
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McRay, Emily C. (Mrs)	1915
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Whitlock, William Thomas.	1915
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WASHINGTON—WEST VIRGINIA—WISCONSIN.

Tacoma.

Faulkner, John William.....	1918
Michael, J. Ralph.....	1920
Porro, Thomas J.....	1920
Rein, Tania.....	1910

Wilbur.

Bandy, George, Ph.G.....	1905
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WEST VIRGINIA.

Bluefield.

Goodykoontz, Charles Henry....	1909
Litz, James Edward.....	1920

Buckhannon.

Young, George Orville, Ph.G....	1907
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Charleston.

Krieg, Arch.....	1916
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Clarksburg.

Haymaker, Frank Berkshire....	1906
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Harpers' Ferry.

Dittmeyer, Walter E., P.D.....	1907
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Huntington.

Hron, Ralph Preston.....	1915
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Lewisburg.

Parker, Ray M.....	1919
Parker, Ross B.....	1920

Morgantown.

Bergy, Gordon Alger.....	1917
Moore, W. H.....	1915
Wood, Frank Davidson.....	1915

Petersburg.

Judy, Marion H.....	1920
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Sutton.

Walker, Alfred.....	1920
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Wellsburg.

Elson, John R.....	1918
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Wheeling.

Baer, Herbert O.....	1916
Coleman, John.....	1905
Herget, Frederick Welton.....	1920
Irwin, William Wilson.....	1914

WISCONSIN.

Barron.

Johnson, Leonard F.....	1921
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Burlington.

Mealy, R. Leslie.....	1922
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Eau Claire.

Boberg, Otto Johan Sinius.....	1913
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Fond du Lac.

Kremer, Berthold James.....	1913
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Hayward.

Giefer, Carl B.....	1921
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Hudson.

Mickelsen, Henry C.....	1918
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Jefferson.

Fischer, Ray Otto.....	1911
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La Crosse.

BEYSLAG, CHARLES.....	1880
Williams, John M.....	1918

Madison.

Chow, Ming Heng.....	1921
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Fischer, Richard, Ph.D.....	1901
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KREMERS, EDWARD, Ph.G.,	
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Ph.D.....	1887
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Langenhan, Henry August.....	1908
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Lewis, Henry.....	1908
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MILLER, EMERSON ROMEO.....	1895
----------------------------	------

Reif, Herman Peter.....	1920
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Richtmann, William Oscar, Ph.G.,	
----------------------------------	--

B.S.....	1904
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Wakeman, Nellie A.....	1918
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Williams, Edward, Ph.C., B.S.,	
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M.S., Phar.M.....	1906
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Milwaukee.

Alberts, M. Lee.....	1912
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Eckstein, Solomon A.....	1912
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Galbraith, Frank Harman.....	1921
------------------------------	------

Keating, Frank.....	1914
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Kochanski, Edmund H. J.....	1918
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Krembs, Ernest Maximilian....	1903
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LaPiana, Victor.....	1921
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Raeuber, Edward Gottfried,	
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Ph.G.....	1900
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Ruenzel, Henry Gottfried.....	1892
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WISCONSIN—WYOMING—DOMINION OF CANADA, ALBERTA—MANITOBA—NEW
BRUNSWICK—ONTARIO—QUEBEC—SASKATCHEWAN—CUBA.

Russell, H. C. 1921
SCHRANK, CHARLES HENRY..... 1876
Thatcher, Edmond Sheldon.... 1917
Urban, Leopold Charles..... 1912
Waldschmidt, Oliver A. 1921

Neillsville.

SNITEMAN, CHARLES CLARENCE.. 1881

Oconomowoc.

Peters, Henry August, M.D.,
Ph.G. 1903

Princeton.

Mueller, Norbert R. 1917

Racine.

Baltes, Miss Helen L. 1920
Horlick, Alexander James..... 1904
Horlick, William..... 1913
Horlick, William Jr. 1913

Richland Center.

Pugh, Clifford Luzerne..... 1920

Superior.

Shapiro, James..... 1921

Thiensville.

Seyfert, Paul..... 1909

Wausau.

Albers, William W. 1909

WYOMING.

Cheyenne.

Roedel, Andrew Edward..... 1919

Greybull.

Simonson, Selmer J. 1921

Guernsey.

Thompson, Samuel F. 1921

Laramie.

Beath, Orville Andrew..... 1919

DOMINION OF CANADA.

ALBERTA.

Edmonton South.

Gaetz, Halley Hamilton..... 1918

MANITOBA.

Winnipeg.

Bletcher, Henry Ernest John... 1904
Colcleugh, Murray Chrisholm... 1913
Connell, Thomas A. 1915

NEW BRUNSWICK.

New Castle.

McCormick, Percy Maurice,
Ph.G. 1916

ONTARIO.

Guelph.

Stewart, Alexander..... 1905

Ottawa.

McGill, Anthony..... 1918
Watters, Henry..... 1912

Stratford.

WAUGH, GEORGE JAMES..... 1862

Toronto.

Graham, William Barton..... 1919
Heebner, Charles Frederick.... 1894
Hurst, Robert Oscar..... 1916

QUEBEC.

Montreal.

Moore, Alexander Benjamin
Journeaux..... 1914

St. Agathe Des Monts.

St. Amour, Omer..... 1915

Three Rivers.

Williams, John Lewis, Doctor
Optics..... 1909

Westmount.

Frosst, Charles E. 1919

SASKATCHEWAN.

Saskatoon.

Campbell, Alexander... 1914

CUBA.

Artemisa.

Gavalda, Milanes Antonio... 1918

Banes, Oriente.

Tamayo, Miguel A. 1920

CUBA—MEXICO—SANTO DOMINGO—FOREIGN COUNTRIES.

<i>Camaguey.</i>		
Catala, Alfredo-Sanchez.....	1919	Ortega, Pedro..... 1921
Larrua, Francisco Hidalgo.....	1922	Ortiz, Augustin..... 1920
Sanchez, Dr. Felix Enrique.....	1920	Pazosy, Boado Felipe..... 1916
Taquechel, Eduardo G.....	1920	Ramirez, Dr. Rogelio H..... 1916
Trillo, y Carballo Anna J.....	1920	<i>Holquin.</i>
<i>Clara.</i>		Gonzales, Teodoro M. Guiter- rez..... 1915
Martinez, Matilde.....	1921	<i>Macabi.</i>
<i>Cruces.</i>		Roth, Herbert Joseph..... 1921
Prieto, Jose Raymon.....	1915	<i>Mantanzas.</i>
<i>Havana.</i>		Mesa, Dr. A..... 1920
Abreu, Gerardo Fernandez.....	1907	<i>Media Luna.</i>
Alacan, Armando J.....	1920	Sanchez, Miguel..... 1919
Alacan, Jose P., Phar.D.....	1907	<i>Palmarito de Canto Oriente.</i>
Alacan, Sylvia C.....	1916	Estevan, Alberto Soler..... 1921
Arrieta, Horacio G.....	1920	<i>Preston, Oriente.</i>
Calonge, Louisa (Miss).....	1916	Baudilio, Castellanos..... 1921
Capote y Diaz, José.....	1920	<i>Santa Clara.</i>
Casas, y Bacallao Gonzales.....	1920	Jimenez, Filomeno..... 1920
Coll, Paula.....	1916	
Delgado, Joila Estrella, M.D....	1915	MEXICO.
Diaz, José Guillermo.....	1907	<i>Mexico City.</i>
Diaz, Dr. Manuel J.....	1920	Braubach, Charles..... 1918
Faundo, Eduardo Garcia.....	1915	Calderon, Guillermo..... 1918
Goltz, Carl Julius.....	1915	
Hernandez, Cartaya J.....	1907	SANTO DOMINGO.
Herrera, Sergio.....	1920	<i>Santo Domingo City.</i>
Johnson, Manuel.....	1907	Rodrigueza, Rene..... 1918
Johnson, Theodore, M.D.....	1911	
Moya, Carlos A.....	1920	

MEMBERS RESIDING IN FOREIGN COUNTRIES.

(Except Canada, Cuba, Mexico and Santo Domingo.)

Abert, Moses Mordechai, B.A., B.C., M.Ph.m., Beirut, Syria.....	1916
Andrade, Caesar Daniel, Guyaquil, Ecuador, S. A.....	1918
Braddock, Elton John, Tutuila, Samoa.....	1921
Chapman, Oswald, Panama City, Panama.....	1916
Dennis, Edward G., Shanghai, China.....	1919
Hertzberg, Paul, Bordeaux, France.....	1920
Jee, S. H., Dr., Shanghai, China.....	1918
Jurado, Bolivar, Ph.C., Ph.B., Panama City, Panama.....	1915
Kracilshchikuff, Solomon, Jaffa, Palestine.....	1921
LADAKIS, TRIANTAPHYLLE, Beirut, Syria.....	1907
Lang, Frank, Cristobal, Panama.....	1920
Marzouk, L. I., Cairo, Egypt.....	1921
McMullin, David John, H. S., U. S. N., Pago Pago, Tutuila, American Samoa.....	1916

Michlin, Jacob, Jerusalem, Palestine.....	1921
Miller, Chas. Elliott, Port Au Prince, Haiti.....	1899
Murray, Alexander, San José de Costa Rica, C. A.....	1903
Pirie, Alfred Mitchell, Cartago, Costa Rica, C. A.....	1903
Rivera, Rafael, Caracas, Venezuela, S. A.....	1920
Sayed, George Abdel, Shebin, El Kom, Egypt.....	1921
Van der Wielen, P., Amsterdam, Netherlands.....	1920
Vidaurreta, Saturnino, Santa Barbara, Honduras, C. A.....	1921
WELLCOME, HENRY SOLOMON, London, England.....	1875
Wooyenaka, Keizo, Tokio, Japan.....	1907

LIST OF MEMBERS WHO HAVE DIED SINCE THE PUBLICATION
OF THE 1918 YEAR BOOK.

DECEASED.	RESIDENCE.	ELECTED.
Asher, Philip.....	New Orleans, La.....	1905
BALZER, GUSTAVUS.....	New York, N. Y.....	1875
Baum, Fred C.....	Ft. Slocum, N. Y.....	1911
Belanger, J. A.....	York, N. D.....	1920
BORING, EDWARD M.....	Philadelphia, Pa.....	1867
Breitenbach, Max. J.....	New York, N. Y.....	1916
Brennan, James E.....	Pawtucket, R. I.....	1909
Burgheim, J.....	Houston, Texas.....	1892
Campbell, George Stelle.....	Milburn, N. J.....	1914
Coderre, Telesphore.....	Witt, Ill.....	1920
Colton, E. T.....	Providence, R. I.....	1909
Cummings, Wm. Leon.....	Syracuse, N. Y.....	1914
DAWSON, JOHN HENRY.....	Glendora, Calif.....	1882
Dodds, Richard N.....	Springfield, Ill.....	1902
Downing, Benjamin F.....	Newport, R. I.....	1886
Dunning, L. T.....	Sioux Falls, S. D.....	1918
Dupree, George.....	Sunbury, Pa.....	1919
Earlin, Clarence Greenwood.....	Pittsburgh, Pa.....	1920
EBERBACH, OTTMAR.....	Ann Arbor, Michigan.....	1869
Feindt, Louis E.....	South Orange, N. J.....	1906
French, Adelbert P.....	Highland Park, Mich.....	1915
Gardner, Alex.....	Brooklyn, N. Y.....	1910
Heckerman, Adam B.....	Port Royal, Pa.....	1915
Hires, Lewis Moore.....	Burlington, N. J.....	1916
Howard, Mrs. Fletcher.....	Los Angeles, Calif.....	1905
Hynson, Henry P.....	Baltimore, Md.....	1890
Jehlik, Anton J.....	Chicago, Ill.....	1906
Judy, N. J.....	Petersburg, W. Va.....	1916
June, Frederick A.....	Jamaica Plain, Mass.....	1920
KAUFFMAN, GEO. B.....	Columbus, Ohio.....	1882
Mayer, Harry O.....	New York, N. Y.....	1919
McColl, Edward Roy.....	Mare Island, Calif.....	1919
McLean, James W.....	Seattle, Wash.....	1911
Miller, Chas.....	Key West, Fla.....	1897
Murphey, E. G.....	East Las Vegas, N. M.....	1909
Muhlberg, Victor C.....	Cincinnati, Ohio.....	1915
Neville, William R.....	Austin, Texas.....	1918
PIERCE, WM. H.....	Boston, Mass.....	1879
Poli, Domingo.....	Guayama, P. R.....	1920
Roehrig, Albert M.....	Savannah, Ga.....	1902
Root, Wilfred F.....	Brattleboro, Vt.....	1912
Ryan, Frank G.....	Detroit, Mich.....	1892
Scheddell, Wm.....	Crown Point, Ind.....	1918
Schlotterbeck, Augustus G.....	Portland, Me.....	1896
Schmidt, Charles H.....	Hoboken, N. J.....	1920
Schmidt, Valentine.....	San Francisco, Calif.....	1887
Schuh, Paul G.....	Cairo, Ill.....	1894

DECEASED.	RESIDENCE.	ELECTED.
Scott, Roy T.....	Monticello, Minn.....	1920
SHOEMAKER, RICHARD M....	Philadelphia, Pa.....	1865
Sieker, Ferdinand A.....	West Hoboken, N. J.....	1893
Sohrbeck, Geo. H.....	Moline, Ill.....	1888
Stofer, Richard Calvin.....	Norwich, N. Y.....	1914
Umenhofer, Adolph.....	Chicago, Ill.....	1908
Walbridge, C. P.....	St. Louis, Mo.....	1901
West, Charles A.....	Boston, Mass.....	1892
WILLIAMS, SEWARD WHITING	Chicago, Ill.....	1887
Wirth, Rudolph.....	Brooklyn, N. Y.....	1917
Zimmerman, Henry Earl.....	Tuscola, Ill.....	1921
Zinn, Charles E.....	Kansas City, Mo.....	1909

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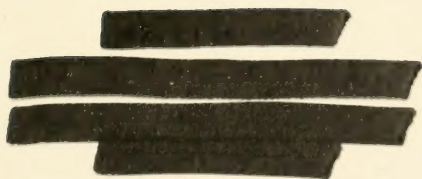
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